

RESEARCH MEMORANDUM

WIND-TUNNEL INVESTIGATION OF THE EFFECT OF ASPECT RATIO
AND CHORDWISE LOCATION ON EFFECTIVENESS OF
SPOILER-SLOT-DEFLECTOR CONTROLS ON THIN
UNTAPERED WINGS AT TRANSONIC SPEEDS

By Alexander D. Hammond and Jarrett K. Huffman

CLASSIFIED BY Langley Aeronautical Laboratory
Langley Field, Va.

APPROVED

In authority of Naca rca 11 8/11/57
Date 11/8/57
NB 1-37-68

CLASSIFIED DOCUMENT

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, U.S.C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

LIBRARY COPY
SEP 20 1957
LANGLEY AERONAUTICAL LABORATORY
LIBRARY, NACA
LANGLEY FIELD, VIRGINIA

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

WASHINGTON

September 19, 1957

CONFIDENTIAL

NACA RM L57G08a

NASA Technical Library



3 1176 01438 1124

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

RESEARCH MEMORANDUM

WIND-TUNNEL INVESTIGATION OF THE EFFECT OF ASPECT RATIO
AND CHORDWISE LOCATION ON EFFECTIVENESS OF
SPOILER-SLOT-DEFLECTOR CONTROLS ON THIN
UNTAPERED WINGS AT TRANSONIC SPEEDS

By Alexander D. Hammond and Jarrett K. Huffman

SUMMARY

A wind-tunnel investigation has been made in the Langley high-speed 7- by 10-foot tunnel by use of the transonic-bump technique to study the effectiveness of spoiler-slot-deflector controls on four unswept untapered wings. The wings had NACA 65A004 airfoil sections. Full-span spoiler-slot-deflectors, projected to 7.5 percent wing chord along the 30-, 50-, 70-, and 90-percent-wing-chord lines, were tested on wings of aspect ratio 1 to 4 at Mach numbers from 0.60 to 1.10. The data are presented without discussion.

INTRODUCTION

The design of spoiler-slot-deflector controls at transonic speeds is hampered by the lack of a satisfactory theoretical approach and the lack of systematic data on the effects of wing aspect ratio and the chordwise location of the control. The effect of these variables on the lateral control characteristics of plain spoiler-type lateral controls is reported in reference 1. There are a number of published investigations of the lateral control characteristics of spoiler-slot-deflector configurations (for example, see refs. 2 to 6) and the data of these investigations have shown certain advantages of the spoiler-slot-deflector combination over the plain spoiler, such as the good control effectiveness at high angles of attack of the spoiler-slot-deflector control.

The present paper presents the results of a wind-tunnel investigation to determine the control effectiveness on four small-scale rectangular semispan wings equipped with spoiler-slot-deflector controls at transonic speeds. The variables investigated were wing aspect ratio (aspect ratios from 1 to 4), control chordwise location (control located from 0.30 to

[REDACTED]

TRANSLATED

0.90 wing chord) and ratio of deflector projection to spoiler projection (projection ratios of 0.50, 0.75, and 1.00). The transonic speeds were obtained by using the transonic-bump technique in the Langley high-speed 7- by 10-foot wind tunnel.

In order to expedite the publication of the results of this investigation, no discussion of the data is presented. All of the data are presented in tabular form and, in addition, some data showing significant trends are presented in graphic form.

COEFFICIENTS AND SYMBOLS

The data are presented about the model wind axes with the origin on the wing root chord line of a longitudinal position corresponding to the quarter-chord of the mean aerodynamic chord.

c_L lift coefficient, $\frac{\text{Twice semispan lift}}{qS}$

c_D drag coefficient, $\frac{\text{Twice semispan drag}}{qS}$

c_m pitching-moment coefficient about 0.25c,
 $\frac{\text{Twice semispan pitching moment}}{qSc}$

c_l rolling-moment coefficient, $\frac{\text{Semispan rolling moment}}{qSb}$

c_n yawing-moment coefficient, $\frac{\text{Semispan yawing moment}}{qSb}$

b wing span, ft

c wing chord, ft

x_s distance of spoiler trailing edge (in the unprojected position) from the wing leading edge, ft

S wing area, sq ft

A wing aspect ratio, b^2/S

| | |
|--|---|
| q | free-stream dynamic pressure, $\frac{1}{2} \rho V^2$, lb/sq ft |
| V | free-stream velocity, ft/sec |
| ρ | free-stream density, slugs/cu ft |
| R | Reynolds number based on wing chord |
| M | free-stream Mach number |
| M_l | local Mach number |
| α | angle of attack, deg |
| δ_s | spoiler projection measured from wing surface (negative when projected above surface of wing), fraction of wing chord |
| δ_d | deflector projection measured from wing surface (negative when projected below surface of wing), fraction of wing chord |
| δ_d/δ_s | deflector projection to spoiler projection ratio |
| ΔC_L , ΔC_m , ΔC_D | change in coefficient due to control deflection, difference between wing with control and plain wing |
| $(\Delta C_N)_{cp}$ | location of longitudinal center of pressure of incremental normal-force coefficient due to control projection |

MODELS

The geometric characteristics of the models used in the investigation are given in figure 1. The models were machined from solid steel to an NACA 65A004 airfoil section. The basic models had no twist or camber and had a taper ratio of 1. The aspect ratio was varied by cutting the wings at the appropriate spanwise station normal to the chord plane.

The flap-type spoiler and deflector controls (fig. 1) extended from the wing root to the wing tip and had a chord of 10 percent of the wing chord. The various locations of the trailing edge of the slot of the spoiler-slot-deflector controls were at the 30-, 50-, 70-, and 90-percent-chordwise stations on the wings. The steel spoiler was hinged to the upper wing surface at the leading edge of the slot. The steel deflector was hinged to the lower wing surface at the trailing edge of the slot. The spoiler projection (δ_s) was 0.075c for all the wings and the deflector

projection was varied to give ratios of deflector projection to spoiler projection of 0.50, 0.75, or 1.00.

TESTS

The tests were made by using the transonic-bump technique in the Langley high-speed 7- by 10-foot tunnel. The models were attached to a five-component electrical strain-gage balance beneath the bump surface. The tests were made over a Mach number range from 0.60 to 1.10 at Reynolds numbers varying from approximately 1.0×10^6 at $M = 0.60$ to approximately 1.3×10^6 at $M = 1.10$. The variation of the local Mach number over the bump in the vicinity of the model location for several Mach numbers is shown in figure 2.

The test angles of attack varied generally from -30° to 20° whenever the loads encountered did not exceed the design limit of the balance. The aspect ratio of the models was varied from 1 to 4.

CORRECTIONS

The data have not been corrected for jet-boundary effects or blocking since the models were sufficiently small with respect to tunnel boundaries as to make the corrections negligible. The roll and yaw data presented represent the rolling- and yawing-moment coefficients resulting from deflections of the control on one wing. Since no reflection-plane corrections have been applied to the data, they represent symmetrically deflected controls and should be reduced if applied to antisymmetric deflection. The magnitude of the corrections (reflection plane) at $M = 0$ obtained from references 7 and 8 are given in figure 3. The variation of the reflection-plane correction with Mach number has not been established in the transonic speed range but does decrease to 0 at supersonic speeds.

RESULTS

The force and moment data obtained in this investigation are presented in tables I to IV. A graphical presentation of some of the data is shown in figures 4 to 7 to give a pictorial description of the typical variation of ΔC_L , ΔC_D , ΔC_m , and $(\Delta C_N)_{cp}$ with the several test parameters. The variation of ΔC_L , ΔC_D , ΔC_m , and $(\Delta C_N)_{cp}$ resulting from projection of the spoiler-slot-deflector control at various chordwise positions is

plotted against aspect ratio in figure 4 against angle of attack in figure 5, and against Mach number in figure 6 for a ratio of deflector projection to spoiler projection (δ_d/δ_s) of 0.75. The variations of ΔC_L , ΔC_D , ΔC_m , and $(\Delta C_N)_{cp}$ with angle of attack for the spoiler-slot-deflector configurations located at the 70-percent-chordwise position on the aspect-ratio-4 model are presented in figure 7 for control projection ratios (δ_d/δ_s) of 0.50, 0.75, and 1.00 at several Mach numbers.

Langley Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., June 18, 1957.

REFERENCES

1. Hammond, Alexander D.: Wind-Tunnel Investigation of the Effect of Aspect Ratio and Chordwise Location on Effectiveness of Plain Spoilers on Thin Untapered Wings at Transonic Speeds. NACA RM L56F20, 1956.
2. Lowry, John G.: Data on Spoiler-Type Ailerons. NACA RM L53I24a, 1953.
3. Vogler, Raymond D.: Wind-Tunnel Investigation at Transonic Speeds of a Spoiler-Slot-Deflector Combination on an Unswept NACA 65A006 Wing. NACA RM L53J21, 1953.
4. Thompson, Robert F., and Taylor, Robert T.: Effect of a Wing Leading-Edge Flap and Chord-Extension on the High Subsonic Control Characteristics of a Spoiler-Slot-Deflector Control Located at Two Spanwise Positions. NACA RM L54I09, 1954.
5. West, F. E., Jr., Whitcomb, Charles F., and Schmeer, James W.: Investigation of Spoiler-Slot-Deflector Ailerons and Other Spoiler Ailerons on a 45° Sweptback-Wing—Fuselage Combination at Mach Numbers From 0.60 to 1.03. NACA RM L56F15, 1956.
6. Hammond, Alexander D., and Brown, Albert E.: The Results of an Investigation at High Subsonic Speeds To Determine the Lateral-Control and Hinge-Moment Characteristics of a Spoiler-Slot-Deflector Configuration on a 35° Sweptback Wing. NACA RM L57C20, 1957.
7. DeYoung, John: Theoretical Symmetric Span Loading Due to Flap Deflection for Wings of Arbitrary Plan Form at Subsonic Speeds. NACA Rep. 1071, 1952. (Supersedes NACA TN 2278.)
8. DeYoung, John: Theoretical Antisymmetric Span Loading for Wings of Arbitrary Plan Form at Subsonic Speeds. NACA Rep. 1056, 1951. (Supersedes NACA TN 2140.)

~~CONFIDENTIAL~~

TABLE I.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING

(a) Plain Wing

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|--------|-------|--------|--------|-------|-------------------|--------|-------|--------|--------|-------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | .1188 | .0043 | -.0224 | .0206 | .0048 | -3 | -.0990 | .0150 | -.0222 | .0120 | .0070 |
| -2 | -.0763 | .0043 | -.0189 | .0155 | .0048 | -2 | -.0841 | .0150 | -.0121 | .0060 | .0084 |
| -1 | -.0424 | .0086 | -.0036 | .0103 | .0024 | -1 | -.0495 | .0150 | -.0083 | .0000 | .0070 |
| 0 | -.0424 | .0086 | -.0013 | .0052 | .0000 | 0 | -.0049 | .0150 | -.0057 | -.0030 | .0056 |
| 1 | -.0169 | .0129 | -.0220 | .0000 | .0024 | 1 | .0149 | .0150 | .0017 | -.0060 | .0070 |
| 2 | .0085 | .0215 | -.0047 | -.0052 | .0024 | 2 | .0495 | .0175 | .0082 | -.0090 | .0070 |
| 3 | .0509 | .0215 | -.0083 | -.0103 | .0024 | 3 | .0891 | .0226 | .0163 | -.0151 | .0084 |
| 5 | .1272 | .0387 | .0007 | -.0155 | .0048 | 5 | .1732 | .0326 | .0199 | -.0241 | .0098 |
| 7 | .1951 | .0430 | .0049 | -.0258 | .0072 | 7 | .2474 | .0526 | .0201 | -.0331 | .0126 |
| 10 | .3138 | .0816 | .0117 | -.0413 | .0120 | 10 | .3959 | .0952 | .0077 | -.0542 | .0182 |
| 20 | .8057 | .3607 | -.0873 | -.1083 | .0505 | 20 | .9106 | .3783 | -.0829 | -.1234 | .0561 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -.0936 | .0030 | -.0257 | .0071 | .0050 | -3 | -.0950 | .0264 | -.0158 | .0087 | .0054 |
| -2 | -.0585 | .0030 | -.0181 | .0036 | .0050 | -2 | -.0665 | .0240 | -.0071 | .0058 | .0040 |
| -1 | -.0293 | .0059 | -.0156 | .0000 | .0033 | -1 | -.0237 | .0192 | -.0020 | .0000 | .0040 |
| 0 | -.0058 | .0030 | -.0165 | -.0036 | .0033 | 0 | 0.0000 | .0216 | .0000 | -.0029 | .0040 |
| 1 | .0058 | .0118 | -.0064 | -.0036 | .0033 | 1 | .0427 | .0264 | .0051 | -.0087 | .0013 |
| 2 | .0527 | .0148 | -.0051 | -.0107 | .0033 | 2 | .0807 | .0264 | .0128 | -.0116 | .0040 |
| 3 | .0702 | .0178 | .0036 | -.0142 | .0050 | 3 | .1187 | .0313 | .0138 | -.0173 | .0054 |
| 5 | .1521 | .0296 | .0057 | -.0249 | .0050 | 5 | .2042 | .0505 | .0131 | -.0289 | .0081 |
| 7 | .2340 | .0444 | .0109 | -.0356 | .0083 | 7 | .3086 | .0721 | .0049 | -.0404 | .0108 |
| 10 | .3686 | .0889 | .0117 | -.0534 | .0166 | 10 | .4510 | .1226 | -.0074 | -.0606 | .0175 |
| 20 | .8484 | .3555 | -.1004 | -.1103 | .0514 | 20 | .9733 | .4110 | -.0991 | -.1299 | .0579 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -.1095 | .0083 | -.0247 | .0067 | .0047 | -3 | -.0997 | .0275 | -.0127 | .0083 | .0013 |
| -2 | -.0657 | .0056 | -.0188 | .0033 | .0047 | -2 | -.0680 | .0275 | -.0069 | .0055 | .0013 |
| -1 | -.0383 | .0083 | -.0134 | -.0033 | .0047 | -1 | -.0227 | .0252 | -.0043 | .0000 | .0013 |
| 0 | -.0109 | .0083 | -.0080 | -.0067 | .0047 | 0 | .0136 | .0298 | -.0034 | -.0055 | .0000 |
| 1 | .0164 | .0111 | -.0056 | -.0133 | .0047 | 1 | .0453 | .0298 | .0051 | -.0110 | .0000 |
| 2 | .0493 | .0139 | -.0017 | -.0167 | .0047 | 2 | .0907 | .0367 | .0087 | -.0138 | .0000 |
| 3 | .0822 | .0167 | .0053 | -.0200 | .0047 | 3 | .1315 | .0413 | .0085 | -.0193 | .0013 |
| 5 | .1643 | .0277 | .0121 | -.0266 | .0062 | 5 | .2040 | .0551 | .0114 | -.0276 | .0039 |
| 7 | .2464 | .0416 | .0142 | -.0366 | .0109 | 7 | .2992 | .0803 | .0020 | -.0414 | .0077 |
| 10 | .3834 | .0832 | .0092 | -.0566 | .0171 | 10 | .4442 | .1285 | -.0148 | -.0579 | .0141 |
| 20 | .8489 | .3521 | -.0993 | -.1166 | .0513 | 20 | .9519 | .4085 | -.1000 | -.1268 | .0553 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -.1291 | .0131 | -.0182 | .0063 | .0044 | -3 | -.1034 | .0327 | -.0112 | .0079 | .0012 |
| -2 | -.0775 | .0131 | -.0195 | .0000 | .0015 | -2 | -.0603 | .0284 | -.0064 | .0052 | .0000 |
| -1 | -.0516 | .0078 | -.0088 | -.0031 | .0015 | -1 | -.0215 | .0284 | -.0029 | -.0026 | .0000 |
| 0 | -.0207 | .0105 | -.0020 | -.0094 | .0000 | 0 | .0129 | .0284 | .0016 | -.0052 | .0000 |
| 1 | .0155 | .0131 | -.0040 | -.0126 | .0015 | 1 | .0517 | .0349 | .0038 | -.0079 | .0012 |
| 2 | .0516 | .0131 | .0014 | -.0157 | .0015 | 2 | .0862 | .0349 | .0059 | -.0131 | .0012 |
| 3 | .0775 | .0209 | .0093 | -.0188 | .0029 | 3 | .1292 | .0393 | .0094 | -.0183 | .0012 |
| 5 | .1549 | .0288 | .0186 | -.0314 | .0044 | 5 | .2068 | .0567 | .0075 | -.0288 | .0024 |
| 7 | .2479 | .0471 | .0165 | -.0408 | .0088 | 7 | .2929 | .0763 | .0009 | -.0393 | .0073 |
| 10 | .3873 | .0915 | .0089 | -.0597 | .0132 | 10 | .4394 | .1221 | -.0147 | -.0603 | .0134 |
| 20 | .8469 | .3555 | -.0922 | -.1193 | .0483 | 20 | .9261 | .3991 | -.1023 | -.1231 | .0513 |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -.0990 | .0150 | -.0222 | .0120 | .0070 | -3 | -.0950 | .0264 | -.0158 | .0087 | .0054 |
| -2 | -.0841 | .0150 | -.0121 | .0060 | .0084 | -2 | -.0665 | .0240 | -.0071 | .0058 | .0040 |
| -1 | -.0495 | .0150 | -.0083 | .0000 | .0070 | -1 | -.0237 | .0192 | -.0020 | .0000 | .0040 |
| 0 | -.0049 | .0150 | -.0057 | -.0030 | .0056 | 0 | 0.0000 | .0216 | .0000 | -.0029 | .0040 |
| 1 | .0149 | .0150 | .0017 | -.0060 | .0070 | 1 | .0427 | .0264 | .0051 | -.0087 | .0013 |
| 2 | .0495 | .0175 | .0082 | -.0090 | .0070 | 2 | .0807 | .0264 | .0128 | -.0116 | .0040 |
| 3 | .0891 | .0226 | .0163 | -.0151 | .0084 | 3 | .1187 | .0313 | .0138 | -.0173 | .0054 |
| 5 | .1732 | .0326 | .0199 | -.0241 | .0098 | 5 | .2042 | .0505 | .0131 | -.0289 | .0081 |
| 7 | .2474 | .0526 | .0201 | -.0331 | .0126 | 7 | .3086 | .0721 | .0049 | -.0404 | .0108 |
| 10 | .3959 | .0952 | .0077 | -.0542 | .0182 | 10 | .4510 | .1226 | -.0074 | -.0606 | .0175 |
| 20 | .9106 | .3783 | -.0829 | -.1234 | .0561 | 20 | .9733 | .4110 | -.0991 | -.1299 | .0579 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -.0950 | .0264 | -.0158 | .0087 | .0054 | -3 | -.0997 | .0275 | -.0127 | .0083 | .0013 |
| -2 | -.0665 | .0240 | -.0071 | .0058 | .0040 | -2 | -.0680 | .0275 | -.0069 | .0055 | .0013 |
| -1 | -.0237 | .0192 | -.0020 | .0000 | .0040 | -1 | -.0227 | .0252 | -.0043 | .0000 | .0013 |
| 0 | 0.0000 | .0216 | .0000 | -.0029 | .0040 | 0 | .0136 | .0298 | -.0034 | -.0055 | .0000 |
| 1 | .0427 | .0264 | .0051 | -.0087 | .0013 | 1 | .0453 | .0298 | .0051 | -.0110 | .0000 |
| 2 | .0807 | .0264 | .0128 | -.0116 | .0040 | 2 | .0907 | .0367 | .0087 | -.0138 | .0000 |
| 3 | .1187 | .0313 | .0138 | -.0173 | .0054 | 3 | .1315 | .0413 | .0085 | -.0193 | .0013 |
| 5 | .2042 | .0505 | .0131 | -.0289 | .0081 | 5 | .2040 | .0551 | .0114 | -.0276 | .0039 |
| 7 | .3086 | .0721 | .0049 | -.0404 | .0108 | 7 | .2992 | .0803 | .0020 | -.0414 | .0077 |
| 10 | .4510 | .1226 | -.0074 | -.0606 | .0175 | 10 | .4442 | .1285 | -.0148 | -.0579 | .0141 |
| 20 | .9733 | .4110 | -.0991 | -.1299 | .0579 | 20 | .9519 | .4085 | -.1000 | -.1268 | .0553 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -.0997 | .0275 | -.0127 | .0083 | .0013 | -3 | -.0997 | .0275 | -.0127 | .0083 | .0013 |
| -2 | -.0680 | .0275 | -.0069 | .0055 | .0013 | -2 | -.0680 | .0275 | -.0069 | .0055 | .0013 |
| -1 | -.0227 | .0252 | -.0043 | .0000 | .0013 | -1 | -.0227 | .0252 | -.0043 | .0000 | .0013 |
| 0 | .0136 | .0298 | -.0034 | -.0055 | .0000 | 0 | .0136 | .0298 | -.0034 | -.0055 | .0000 |
| 1 | .0453 | .0298 | .0051 | -.0110 | .0000 | 1 | .0517 | .0349 | .0038 | -.0079 | .0012 |
| 2 | .0907 | .0367 | .0087 | -.0138 | .0000 | 2 | .0862 | .0349 | .0059 | -.0131 | .0012 |
| 3 | .1315 | .0413 | .0085 | -.0193 | .0013 | 3 | .1292 | .0393 | .0094 | -.0183 | .0012 |
| 5 | .2040 | .0551 | .0114 | -.0276 | .0039 | 5 | .2068 | .0567 | .0075 | -.0288 | .0024 |
| 7 | .2992 | .0763 | .0009 | -.0393 | .0073 | 7 | .2929 | .0763 | .0009 | -.0393 | .0073 |
| 10 | .4394 | .1221 | -.0147 | -.0603 | .0134 | 10 | .4394 | .1221 | -.0147 | -.0603 | .0134 |
| 20 | .9261 | .3991 | -.1023 | -.1231 | .0513 | 20 | .9261 | .3991 | -.1023 | -.1231 | .0513 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -.1034 | .0327 | -.0112 | .0079 | .0012 | -3 | -.1034 | .0327 | -.0112 | .0079 | .0012 |
| -2 | -.0603 | .0284 | -.0064 | .0052 | .0000 | -2 | -.0603 | .0284 | -.0064 | .0052 | .0000 |
| -1 | -.0215 | .0284 | -.0029 | -.0026 | .0000 | -1 | -.0215 | .0284 | -.0029 | -.0026 | .0000 |
| 0 | .0129 | .0284 | .0016 | -.0052 | .0000 | 0 | .0129 | .0284 | .0016 | -.0052 | .0000 |
| 1 | .0517 | .0349 | .0038 | -.0079 | .0012 | 1 | .0517 | .0349 | .0038 | -.0079 | .0012 |
| 2 | .0862 | .0349 | .0059 | -.0131 | .0012 | 2 | .0862 | .0349 | .0059 | -.0131 | .0012 |
| 3 | .1292 | .0393 | .0094 | -.0183 | .0012 | 3 | .1292 | .0393 | .0094 | -.0183 | .0012 |
| 5 | .2068 | .0567 | .0075 | -.0288 | .0024 | 5 | .2068 | .0567 | .0075 | -.0288 | .0024 |
| 7 | .2929 | .0763 | .0009 | -.0393 | .0073 | 7 | .2929 | .0763 | .0009 | -.0393 | .0073 |
| 10 | .4394 | .1221 | -.0147 | -.0603 | .0134 | 10 | .4394 | .1221 | -.0147 | -.0603 | .0134 |
| 20 | .9261 | .3991 | -.1023 | -.1231 | .0513 | 20 | .9261 | .3991 | -.1023 | -.1231 | .0513 |

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

TABLE I.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Continued

(b) $x_s/c = 0.30; \delta_s = -0.075; \delta_d/\delta_s = 0.75$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|--------|---------|---------|---------|-------------------|---------|--------|---------|---------|---------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.2797 | 0.1674 | -0.0453 | 0.0374 | 0.0313 | -3 | -0.3268 | 0.2382 | -0.0517 | 0.0399 | 0.0351 |
| -2 | -0.2585 | 0.1674 | -0.0453 | 0.0348 | 0.0300 | -2 | -0.3070 | 0.2319 | -0.0432 | 0.0369 | 0.0337 |
| -1 | -0.2288 | 0.1738 | -0.0392 | 0.0309 | 0.0276 | -1 | -0.2847 | 0.2344 | -0.0400 | 0.0339 | 0.0316 |
| 0 | -0.1992 | 0.1695 | -0.0486 | 0.0271 | 0.0252 | 0 | -0.2699 | 0.2382 | -0.0385 | 0.0309 | 0.0302 |
| 1 | -0.1865 | 0.1824 | -0.0668 | 0.0245 | 0.0264 | 1 | -0.2451 | 0.2344 | -0.0477 | 0.0279 | 0.0288 |
| 2 | -0.1441 | 0.1867 | -0.0687 | 0.0193 | 0.0240 | 2 | -0.2129 | 0.2319 | -0.0485 | 0.0233 | 0.0281 |
| 3 | -0.1229 | 0.1974 | -0.0620 | 0.0155 | 0.0252 | 3 | -0.1832 | 0.2319 | -0.0529 | 0.0196 | 0.0274 |
| 5 | -0.0636 | 0.2124 | -0.0599 | 0.0064 | 0.0264 | 5 | -0.1213 | 0.2344 | -0.0538 | 0.0105 | 0.0267 |
| 7 | -0.0127 | 0.2253 | -0.0641 | -0.0039 | 0.0252 | 7 | -0.0421 | 0.2319 | -0.0618 | 0.0008 | 0.0260 |
| 10 | 0.0763 | 0.2446 | -0.0638 | -0.0193 | 0.0276 | 10 | 0.0767 | 0.2407 | -0.0632 | -0.0181 | 0.0274 |
| 20 | 0.4280 | 0.3841 | -0.0634 | -0.0670 | 0.0529 | 20 | 0.5720 | 0.3824 | -0.1145 | -0.0776 | 0.0548 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.3332 | 0.1998 | -0.0466 | 0.0418 | 0.0348 | -3 | -0.2352 | 0.2442 | -0.0770 | 0.0275 | 0.0337 |
| -2 | -0.3186 | 0.1983 | -0.0511 | 0.0391 | 0.0332 | -2 | -0.2043 | 0.2406 | -0.0692 | 0.0224 | 0.0323 |
| -1 | -0.2981 | 0.1998 | -0.0382 | 0.0364 | 0.0307 | -1 | -0.1758 | 0.2430 | -0.0640 | 0.0181 | 0.0303 |
| 0 | -0.2601 | 0.1998 | -0.0429 | 0.0329 | 0.0290 | 0 | -0.1402 | 0.2466 | -0.0652 | 0.0130 | 0.0290 |
| 1 | -0.2484 | 0.2072 | -0.0483 | 0.0293 | 0.0282 | 1 | -0.1045 | 0.2466 | -0.0773 | 0.0079 | 0.0243 |
| 2 | -0.2163 | 0.2027 | -0.0614 | 0.0258 | 0.0274 | 2 | -0.0808 | 0.2466 | -0.0777 | 0.0036 | 0.0256 |
| 3 | -0.1783 | 0.2057 | -0.0538 | 0.0213 | 0.0282 | 3 | -0.0570 | 0.2466 | -0.0814 | 0.0000 | 0.0270 |
| 5 | -0.1140 | 0.2116 | -0.0457 | 0.0124 | 0.0282 | 5 | 0.0024 | 0.2490 | -0.0731 | -0.0065 | 0.0276 |
| 7 | -0.0497 | 0.2131 | -0.0588 | 0.0036 | 0.0274 | 7 | 0.0618 | 0.2502 | -0.0834 | -0.0159 | 0.0283 |
| 10 | 0.0555 | 0.2249 | -0.0586 | -0.0124 | 0.0274 | 10 | 0.1805 | 0.2610 | -0.0803 | -0.0325 | 0.0310 |
| 20 | 0.4501 | 0.3507 | -0.0752 | -0.0631 | 0.0489 | 20 | 0.6438 | 0.4113 | -0.1392 | -0.0896 | 0.0593 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.3393 | 0.2120 | -0.0457 | 0.0441 | 0.0349 | -3 | -0.2143 | 0.2274 | -0.0755 | 0.0243 | 0.0091 |
| -2 | -0.3311 | 0.2106 | -0.0494 | 0.0416 | 0.0326 | -2 | -0.1756 | 0.2309 | -0.0670 | 0.0194 | 0.0129 |
| -1 | -0.3065 | 0.2092 | -0.0404 | 0.0391 | 0.0310 | -1 | -0.1414 | 0.2309 | -0.0683 | 0.0139 | 0.0084 |
| 0 | -0.2846 | 0.2106 | -0.0352 | 0.0350 | 0.0295 | 0 | -0.1072 | 0.2332 | -0.0682 | 0.0090 | -0.0019 |
| 1 | -0.2682 | 0.2106 | -0.0479 | 0.0308 | 0.0287 | 1 | -0.0889 | 0.2309 | -0.0834 | 0.0035 | -0.0129 |
| 2 | -0.2244 | 0.2106 | -0.0483 | 0.0275 | 0.0279 | 2 | -0.0547 | 0.2367 | -0.0853 | -0.0007 | -0.0013 |
| 3 | -0.1888 | 0.2106 | -0.0430 | 0.0225 | 0.0279 | 3 | -0.0319 | 0.2425 | -0.0870 | -0.0118 | -0.0013 |
| 5 | -0.1286 | 0.2134 | -0.0453 | 0.0133 | 0.0272 | 5 | 0.0365 | 0.2482 | -0.0885 | -0.0166 | -0.0032 |
| 7 | -0.0575 | 0.2134 | -0.0580 | 0.0042 | 0.0264 | 7 | 0.1163 | 0.2540 | -0.0857 | -0.0250 | 0.0103 |
| 10 | 0.0520 | 0.2217 | -0.0599 | -0.0133 | 0.0272 | 10 | 0.2257 | 0.2690 | -0.0954 | -0.0416 | 0.0129 |
| 20 | 0.4761 | 0.3533 | -0.0808 | -0.0657 | 0.0505 | 20 | 0.6795 | 0.4387 | -0.1550 | -0.0978 | 0.0472 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.3385 | 0.2185 | -0.0470 | 0.0432 | 0.0344 | -3 | -0.2134 | 0.1932 | -0.0696 | 0.0223 | -0.0147 |
| -2 | -0.3281 | 0.2158 | -0.0491 | 0.0401 | 0.0330 | -2 | -0.1724 | 0.1964 | -0.0673 | 0.0177 | -0.0153 |
| -1 | -0.3075 | 0.2158 | -0.0407 | 0.0377 | 0.0308 | -1 | -0.1315 | 0.1986 | -0.0614 | 0.0118 | -0.0196 |
| 0 | -0.2894 | 0.2198 | -0.0353 | 0.0338 | 0.0293 | 0 | -0.1056 | 0.2019 | -0.0616 | 0.0072 | -0.0220 |
| 1 | -0.2687 | 0.2224 | -0.0451 | 0.0306 | 0.0286 | 1 | -0.1056 | 0.2019 | -0.0878 | 0.0026 | -0.0226 |
| 2 | -0.2300 | 0.2132 | -0.0535 | 0.0275 | 0.0278 | 2 | -0.0409 | 0.2128 | -0.0889 | -0.0033 | -0.0220 |
| 3 | -0.2015 | 0.2158 | -0.0493 | 0.0228 | 0.0278 | 3 | -0.0259 | 0.2150 | -0.0723 | -0.0085 | -0.0196 |
| 5 | -0.1395 | 0.2224 | -0.0453 | 0.0141 | 0.0271 | 5 | 0.0453 | 0.2292 | -0.0844 | -0.0190 | -0.0183 |
| 7 | -0.0698 | 0.2198 | -0.0537 | 0.0039 | 0.0257 | 7 | 0.1315 | 0.2346 | -0.0777 | -0.0301 | -0.0147 |
| 10 | 0.0491 | 0.2250 | -0.0573 | -0.0134 | 0.0271 | 10 | 0.2328 | 0.2510 | -0.0851 | -0.0446 | -0.0079 |
| 20 | 0.5012 | 0.3624 | -0.0952 | -0.0699 | 0.0506 | 20 | 0.6487 | 0.4365 | -0.1433 | -0.1003 | 0.0293 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.2352 | 0.2442 | -0.0770 | 0.0275 | 0.0337 | -3 | -0.2143 | 0.2274 | -0.0755 | 0.0243 | 0.0091 |
| -2 | -0.2043 | 0.2406 | -0.0692 | 0.0224 | 0.0323 | -2 | -0.1756 | 0.2309 | -0.0670 | 0.0194 | 0.0129 |
| -1 | -0.1758 | 0.2430 | -0.0640 | 0.0181 | 0.0303 | -1 | -0.1414 | 0.2309 | -0.0683 | 0.0139 | 0.0084 |
| 0 | -0.1402 | 0.2466 | -0.0652 | 0.0130 | 0.0290 | 0 | -0.1072 | 0.2332 | -0.0682 | 0.0090 | -0.0019 |
| 1 | -0.1045 | 0.2466 | -0.0773 | 0.0079 | 0.0243 | 1 | -0.0889 | 0.2309 | -0.0834 | 0.0035 | -0.0129 |
| 2 | -0.0808 | 0.2466 | -0.0777 | 0.0036 | 0.0256 | 2 | -0.0547 | 0.2367 | -0.0853 | -0.0007 | -0.0013 |
| 3 | -0.0570 | 0.2466 | -0.0814 | 0.0000 | 0.0270 | 3 | -0.0319 | 0.2425 | -0.0870 | -0.0118 | -0.0013 |
| 5 | 0.0024 | 0.2490 | -0.0731 | -0.0065 | 0.0276 | 5 | 0.0365 | 0.2482 | -0.0885 | -0.0166 | -0.0032 |
| 7 | 0.0618 | 0.2502 | -0.0834 | -0.0159 | 0.0283 | 7 | 0.1163 | 0.2540 | -0.0857 | -0.0250 | 0.0103 |
| 10 | 0.1805 | 0.2610 | -0.0803 | -0.0325 | 0.0310 | 10 | 0.2257 | 0.2690 | -0.0954 | -0.0416 | 0.0129 |
| 20 | 0.6438 | 0.4113 | -0.1392 | -0.0896 | 0.0593 | 20 | 0.6795 | 0.4387 | -0.1550 | -0.0978 | 0.0472 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.2143 | 0.2274 | -0.0755 | 0.0243 | 0.0091 | -3 | -0.2134 | 0.1932 | -0.0696 | 0.0223 | -0.0147 |
| -2 | -0.1756 | 0.2309 | -0.0670 | 0.0194 | 0.0129 | -2 | -0.1724 | 0.1964 | -0.0673 | 0.0177 | -0.0153 |
| -1 | -0.1414 | 0.2309 | -0.0683 | 0.0139 | 0.0084 | -1 | -0.1315 | 0.1986 | -0.0614 | 0.0118 | -0.0196 |
| 0 | -0.1072 | 0.2332 | -0.0682 | 0.0090 | -0.0019 | 0 | -0.1056 | 0.2019 | -0.0616 | 0.0072 | -0.0220 |
| 1 | -0.0889 | 0.2309 | -0.0834 | 0.0035 | -0.0129 | 1 | -0.1056 | 0.2019 | -0.0878 | 0.0026 | -0.0226 |
| 2 | -0.0547 | 0.2367 | -0.0853 | -0.0007 | -0.0013 | 2 | -0.0409 | 0.2128 | -0.0889 | -0.0033 | -0.0220 |
| 3 | -0.0319 | 0.2425 | -0.0870 | -0.0118 | -0.0013 | 3 | -0.0259 | 0.2150 | -0.0723 | -0.0085 | -0.0196 |
| 5 | 0.0365 | 0.2482 | -0.0885 | -0.0166 | -0.0032 | 5 | 0.0453 | 0.2292 | -0.0844 | -0.0190 | -0.0183 |
| 7 | 0.1163 | 0.2540 | -0.0857 | -0.0250 | 0.0103 | 7 | 0.1315 | 0.2346 | -0.0777 | -0.0301 | -0.0147 |
| 10 | 0.2257 | 0.2690 | -0.0954 | -0.0416 | 0.0129 | 10 | 0.2328 | 0.2510 | -0.0851 | -0.0446 | -0.0079 |
| 20 | 0.6795 | 0.4387 | -0.1550 | -0.0978 | 0.0472 | 20 | 0.6487 | 0.4365 | -0.1433 | -0.1003 | 0.0293 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.2134 | 0.1932 | -0.0696 | 0.0223 | -0.0147 | -3 | -0.2124 | 0.1964 | -0.0673 | 0.0177 | -0.0153 |
| -2 | -0.1724 | 0.1964 | -0.0673 | 0.0177 | -0.0153 | -2 | -0.1315 | 0.1986 | -0.0614 | 0.0118 | -0.0196 |
| -1 | -0.1315 | 0.1986 | -0.0614 | 0.0118 | -0.0196 | -1 | -0.1056 | 0.2019 | -0.0616 | 0.0072 | -0.0220 |
| 0 | -0.1056 | 0.2019 | -0.0616 | 0.0072 | -0.0220 | 0 | -0.1056 | 0.2019 | -0.0878 | 0.0026 | -0.0226 |
| 1 | -0.1056 | 0.2019 | -0.0878 | 0.0026 | -0.0226 | 1 | -0.0409 | 0.2128 | -0.0889 | -0.0033 | -0.0220 |
| 2 | -0.0409 | 0.2128 | -0.0889 | -0.0033 | -0.0220 | 2 | -0.0259 | 0.2150 | -0.0723 | -0.0085 | -0.0196 |
| 3 | -0.0259 | 0.2150 | -0.0723 | -0.0085 | -0.0196 | 3 | 0.0453 | 0.2292 | -0.0844 | -0.0190 | -0.0183 |
| 5 | 0.0453 | 0.2292 | -0.0844 | -0.0190 | -0.0183 | 5 | 0.1315 | 0.2346 | -0.0777 | -0.0301 | -0.0147 |
| 7 | 0.1315 | 0.2346 | -0.0777 | -0.0301 | -0.0147 | 7 | 0.1315 | 0.2346 | -0.1433 | -0.1003 | 0.0293 |
| 10 | 0.2328 | 0.2510 | -0.0851 | -0.0446 | -0.0079 | 10 | 0.2328 | 0.2510 | -0.1433 | -0.1003 | 0.0293 |
| 20 | 0.6487 | 0.4365 | -0.1433 | -0.1003 | 0.0293 | 20 | 0.6487 | 0.4365 | -0.1433 | -0.1003 | 0.0293 |

~~CONFIDENTIAL~~

TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Continued

(c) $x_s/c = 0.50$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|-------|---------|---------|-------|-------------------|---------|-------|---------|---------|---------|
| M = 0.60 | | | | | | M = 0.95 | | | | | |
| -3 | -0.4371 | .1934 | -0.0130 | .0477 | .0193 | -3 | -0.4263 | .2309 | -0.0119 | .0452 | .0197 |
| -2 | -0.4158 | .1934 | -0.0071 | .0439 | .0168 | -2 | -0.4089 | .2259 | .0002 | .0415 | .0176 |
| -1 | -0.3819 | .1805 | -0.0046 | .0413 | .0156 | -1 | -0.3891 | .2234 | .0026 | .0399 | .0162 |
| 0 | -0.3565 | .1719 | -0.0189 | .0387 | .0156 | 0 | -0.3668 | .2208 | .0030 | .0362 | .0155 |
| 1 | -0.3565 | .1934 | -0.0161 | .0348 | .0156 | 1 | -0.3420 | .2158 | .0083 | .0332 | .0155 |
| 2 | -0.3182 | .1719 | -0.0110 | .0323 | .0144 | 2 | -0.3024 | .2133 | .0078 | .0279 | .0148 |
| 3 | -0.2928 | .1934 | -0.0065 | .0271 | .0144 | 3 | -0.2602 | .2008 | .0056 | .0241 | .0141 |
| 5 | -0.2291 | .1934 | -0.0064 | .0181 | .0144 | 5 | -0.1983 | .2008 | .0207 | .0151 | .0141 |
| 7 | -0.1273 | .1934 | -0.0099 | .0077 | .0156 | 7 | -0.1115 | .1982 | .0182 | .0053 | .0141 |
| 10 | -0.0170 | .2019 | -0.0105 | -0.0103 | .0156 | 10 | .0124 | .1958 | .0161 | -0.0121 | .0148 |
| 20 | .3607 | .3523 | -0.0353 | -0.0606 | .0349 | 20 | .4734 | .3338 | -0.0593 | -0.0678 | .0387 |
| M = 0.80 | | | | | | M = 1.00 | | | | | |
| -3 | -0.4596 | .2134 | -0.0070 | .0525 | .0191 | -3 | -0.3211 | .2433 | -0.0563 | .0289 | .0189 |
| -2 | -0.4538 | .2105 | .0022 | .0507 | .0183 | -2 | -0.2854 | .2408 | -0.0497 | .0246 | .0169 |
| -1 | -0.4245 | .2075 | .0087 | .0481 | .0158 | -1 | -0.2736 | .2408 | -0.0436 | .0224 | .0162 |
| 0 | -0.4099 | .2075 | .0124 | .0445 | .0149 | 0 | -0.2260 | .2408 | -0.0426 | .0166 | .0155 |
| 1 | -0.3835 | .2075 | .0066 | .0401 | .0149 | 1 | -0.2117 | .2360 | -0.0379 | .0145 | .0155 |
| 2 | -0.3542 | .2016 | .0114 | .0374 | .0141 | 2 | -0.1713 | .2288 | -0.0410 | .0087 | .0155 |
| 3 | -0.3132 | .1986 | .0142 | .0312 | .0133 | 3 | -0.1308 | .2288 | -0.0435 | .0036 | .0155 |
| 5 | -0.2400 | .1927 | .0187 | .0214 | .0125 | 5 | -0.0595 | .2288 | -0.0368 | -0.0051 | .0148 |
| 7 | -0.1464 | .1838 | .0102 | .0107 | .0133 | 7 | .0119 | .2240 | -0.0331 | -0.0145 | .0155 |
| 10 | -0.0029 | .1867 | .0090 | -0.0080 | .0149 | 10 | .1071 | .2240 | -0.0181 | -0.0253 | .0189 |
| 20 | .3952 | .3231 | -0.0410 | -0.0596 | .0340 | 20 | .5471 | .3854 | -0.0817 | -0.0781 | .0452 |
| M = 0.85 | | | | | | M = 1.05 | | | | | |
| -3 | -0.4658 | .2192 | .0004 | .0517 | .0583 | -3 | -0.2902 | .2296 | -0.0627 | .0241 | .0161 |
| -2 | -0.4521 | .2220 | .0076 | .0492 | .0567 | -2 | -0.2585 | .2296 | -0.0539 | .0200 | .0148 |
| -1 | -0.4357 | .2081 | .0178 | .0467 | .0171 | -1 | -0.2267 | .2227 | -0.0552 | .0165 | .0141 |
| 0 | -0.4138 | .2081 | .0154 | .0433 | .0163 | 0 | -0.1972 | .2227 | -0.0490 | .0117 | .0129 |
| 1 | -0.3836 | .2025 | .0107 | .0392 | .0155 | 1 | -0.1700 | .2250 | -0.0524 | .0083 | .0129 |
| 2 | -0.3562 | .1942 | .0206 | .0358 | .0140 | 2 | -0.1338 | .2227 | -0.0509 | .0034 | .0122 |
| 3 | -0.3151 | .1942 | .0172 | .0308 | .0140 | 3 | -0.0907 | .2181 | -0.0520 | -0.0007 | .0122 |
| 5 | -0.2384 | .1859 | .0185 | .0208 | .0140 | 5 | -0.0295 | .2181 | -0.0387 | -0.0097 | .0129 |
| 7 | -0.1507 | .1803 | .0219 | .0100 | .0140 | 7 | .0453 | .2181 | -0.0337 | -0.0193 | .0148 |
| 10 | -0.0000 | .1803 | .0190 | -0.0083 | .0148 | 10 | .1587 | .2250 | -0.0330 | -0.0310 | .0174 |
| 20 | .4110 | .3191 | -0.0434 | -0.0608 | .0350 | 20 | .6121 | .4017 | -0.1083 | -0.0862 | .0469 |
| M = 0.90 | | | | | | M = 1.10 | | | | | |
| -3 | -0.4530 | .2228 | -0.0020 | .0496 | .0191 | -3 | -0.2848 | .2184 | -0.0557 | .0223 | .0141 |
| -2 | -0.4401 | .2228 | .0105 | .0472 | .0176 | -2 | -0.2546 | .2163 | -0.0492 | .0184 | .0129 |
| -1 | -0.4194 | .2176 | .0130 | .0449 | .0169 | -1 | -0.2157 | .2097 | -0.0568 | .0144 | .0122 |
| 0 | -0.4039 | .2123 | .0156 | .0417 | .0154 | 0 | -0.1942 | .2075 | -0.0510 | .0112 | .0116 |
| 1 | -0.3754 | .2097 | .0205 | .0394 | .0154 | 1 | -0.1597 | .2097 | -0.0485 | .0066 | .0110 |
| 2 | -0.3417 | .2045 | .0184 | .0346 | .0147 | 2 | -0.1294 | .2075 | -0.0437 | .0020 | .0110 |
| 3 | -0.3107 | .1966 | .0185 | .0299 | .0140 | 3 | -0.0841 | .2053 | -0.0499 | -0.0020 | .0110 |
| 5 | -0.2252 | .1887 | .0267 | .0197 | .0132 | 5 | -0.0216 | .2075 | -0.0359 | -0.0105 | .0116 |
| 7 | -0.1450 | .1835 | .0195 | .0094 | .0132 | 7 | .0539 | .2053 | -0.0348 | -0.0197 | .0129 |
| 10 | 0.0000 | .1835 | .0202 | -0.0094 | .0147 | 10 | .1575 | .2141 | -0.0294 | -0.0315 | .0159 |
| 20 | .4401 | .3277 | -0.0481 | -0.0630 | .0360 | 20 | .5933 | .3932 | -0.1024 | -0.0840 | -0.0795 |

~~CONFIDENTIAL~~

TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Continued

(d) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.4071 | 0.1782 | 0.0683 | 0.0516 | 0.0084 | -3 | -0.3890 | 0.2007 | 0.0443 | 0.0505 | 0.0141 |
| -2 | -0.3816 | 0.1653 | 0.0670 | 0.0490 | 0.0072 | -2 | -0.3568 | 0.1932 | 0.0527 | 0.0467 | 0.0141 |
| -1 | -0.3435 | 0.1546 | 0.0724 | 0.0438 | 0.0060 | -1 | -0.3271 | 0.1882 | 0.0535 | 0.0429 | 0.0126 |
| 0 | -0.3180 | 0.1395 | 0.0558 | 0.0426 | 0.0060 | 0 | -0.2899 | 0.1857 | 0.0621 | 0.0384 | 0.0119 |
| 1 | -0.2968 | 0.1782 | 0.0437 | 0.0374 | 0.0060 | 1 | -0.2552 | 0.1781 | 0.0575 | 0.0347 | 0.0112 |
| 2 | -0.2544 | 0.1782 | 0.0478 | 0.0335 | 0.0060 | 2 | -0.2230 | 0.1756 | 0.0646 | 0.0301 | 0.0119 |
| 3 | -0.2120 | 0.1804 | 0.0564 | 0.0297 | 0.0060 | 3 | -0.1784 | 0.1731 | 0.0623 | 0.0249 | 0.0112 |
| 5 | -0.1484 | 0.1825 | 0.0591 | 0.0193 | 0.0060 | 5 | -0.0991 | 0.1756 | 0.0708 | 0.0151 | 0.0119 |
| 7 | -0.0466 | 0.1847 | 0.0594 | 0.0103 | 0.0072 | 7 | -0.0124 | 0.1756 | 0.0677 | 0.0060 | 0.0126 |
| 10 | 0.0424 | 0.2125 | 0.0575 | -0.0064 | 0.0096 | 10 | 0.1115 | 0.1907 | 0.0716 | -0.0098 | 0.0155 |
| 20 | 0.5725 | 0.4401 | -0.0144 | -0.0735 | 0.0373 | 20 | 0.6318 | 0.3889 | -0.0188 | -0.0791 | 0.0450 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.4389 | 0.1926 | 0.0573 | 0.0560 | 0.0116 | -3 | -0.3115 | 0.2047 | 0.0107 | 0.0398 | 0.0142 |
| -2 | -0.4037 | 0.1837 | 0.0698 | 0.0516 | 0.0100 | -2 | -0.2782 | 0.2011 | 0.0194 | 0.0362 | 0.0128 |
| -1 | -0.3745 | 0.1778 | 0.0821 | 0.0472 | 0.0091 | -1 | -0.2497 | 0.1926 | 0.0166 | 0.0325 | 0.0121 |
| 0 | -0.3511 | 0.1763 | 0.0690 | 0.0436 | 0.0091 | 0 | -0.2140 | 0.1902 | 0.0183 | 0.0275 | 0.0115 |
| 1 | -0.3189 | 0.1733 | 0.0748 | 0.0409 | 0.0083 | 1 | -0.1831 | 0.2468 | 0.0228 | 0.0239 | 0.0115 |
| 2 | -0.2779 | 0.1674 | 0.0736 | 0.0356 | 0.0083 | 2 | -0.1427 | 0.1842 | 0.0274 | 0.0188 | 0.0115 |
| 3 | -0.2399 | 0.1644 | 0.0732 | 0.0302 | 0.0083 | 3 | -0.0951 | 0.1830 | 0.0213 | 0.0137 | 0.0101 |
| 5 | -0.1638 | 0.1629 | 0.0758 | 0.0205 | 0.0075 | 5 | -0.0285 | 0.1842 | 0.0397 | 0.0058 | 0.0128 |
| 7 | -0.0702 | 0.1644 | 0.0820 | 0.0098 | 0.0091 | 7 | 0.0595 | 0.1866 | 0.0374 | -0.0036 | 0.0135 |
| 10 | 0.0614 | 0.1852 | 0.0710 | -0.0071 | 0.0108 | 10 | 0.1902 | 0.2131 | 0.0397 | -0.0195 | 0.0182 |
| 20 | 0.5793 | 0.3837 | -0.0200 | -0.0730 | 0.0390 | 20 | 0.7253 | 0.4334 | -0.0445 | -0.0904 | 0.0506 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.4381 | 0.1941 | 0.0621 | 0.0550 | 0.0132 | -3 | -0.3105 | 0.1928 | -0.0011 | 0.0386 | 0.0116 |
| -2 | -0.4108 | 0.1886 | 0.0766 | 0.0516 | 0.0116 | -2 | -0.2720 | 0.1859 | 0.0011 | 0.0338 | 0.0096 |
| -1 | -0.3751 | 0.1858 | 0.0831 | 0.0475 | 0.0109 | -1 | -0.2357 | 0.1825 | 0.0071 | 0.0283 | 0.0096 |
| 0 | -0.3478 | 0.1775 | 0.0717 | 0.0433 | 0.0101 | 0 | -0.2040 | 0.1779 | 0.0117 | 0.0262 | 0.0084 |
| 1 | -0.3067 | 0.1761 | 0.0851 | 0.0400 | 0.0101 | 1 | -0.1700 | 0.1756 | 0.0087 | 0.0214 | 0.0077 |
| 2 | -0.2738 | 0.1636 | 0.0846 | 0.0358 | 0.0101 | 2 | -0.1315 | 0.1744 | 0.0187 | 0.0172 | 0.0084 |
| 3 | -0.2382 | 0.1664 | 0.0764 | 0.0316 | 0.0093 | 3 | -0.0907 | 0.1721 | 0.0184 | 0.0138 | 0.0090 |
| 5 | -0.1561 | 0.1622 | 0.0791 | 0.0217 | 0.0101 | 5 | -0.0113 | 0.1767 | 0.0312 | 0.0041 | 0.0103 |
| 7 | -0.0602 | 0.1650 | 0.0819 | 0.0108 | 0.0109 | 7 | 0.0816 | 0.1859 | 0.0267 | -0.0062 | 0.0129 |
| 10 | 0.0712 | 0.1802 | 0.0781 | -0.0058 | 0.0132 | 10 | 0.2221 | 0.2146 | 0.0184 | -0.0241 | 0.0167 |
| 20 | 0.5805 | 0.3743 | -0.0191 | -0.0724 | 0.0388 | 20 | 0.7139 | 0.4338 | -0.0431 | -0.0875 | 0.0456 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.4267 | 0.1964 | 0.0585 | 0.0551 | 0.0147 | -3 | -0.3127 | 0.1802 | 0.0051 | 0.0354 | 0.0128 |
| -2 | -0.3931 | 0.1912 | 0.0710 | 0.0511 | 0.0125 | -2 | -0.2588 | 0.1791 | -0.0001 | 0.0295 | 0.0092 |
| -1 | -0.3621 | 0.1859 | 0.0768 | 0.0464 | 0.0117 | -1 | -0.2265 | 0.1747 | 0.0061 | 0.0262 | 0.0080 |
| 0 | -0.3336 | 0.1833 | 0.0798 | 0.0425 | 0.0117 | 0 | -0.1898 | 0.1692 | 0.0065 | 0.0216 | 0.0092 |
| 1 | -0.2974 | 0.1768 | 0.0807 | 0.0393 | 0.0110 | 1 | -0.1574 | 0.1671 | 0.0115 | 0.0171 | 0.0092 |
| 2 | -0.2586 | 0.1715 | 0.0812 | 0.0354 | 0.0110 | 2 | -0.1165 | 0.1660 | 0.0168 | 0.0118 | 0.0116 |
| 3 | -0.2198 | 0.1663 | 0.0766 | 0.0315 | 0.0110 | 3 | -0.0669 | 0.1638 | 0.0116 | 0.0085 | 0.0110 |
| 5 | -0.1422 | 0.1663 | 0.0839 | 0.0220 | 0.0110 | 5 | -0.0043 | 0.1671 | 0.0186 | 0.0000 | 0.0104 |
| 7 | -0.0466 | 0.1663 | 0.0825 | 0.0102 | 0.0117 | 7 | 0.0863 | 0.1780 | 0.0215 | -0.0111 | 0.0135 |
| 10 | 0.0802 | 0.1859 | 0.0807 | -0.0071 | 0.0132 | 10 | 0.2157 | 0.2075 | 0.0145 | -0.0275 | 0.0165 |
| 20 | 0.5949 | 0.3732 | -0.0162 | -0.0747 | 0.0418 | 20 | 0.6901 | 0.4171 | -0.0458 | -0.0879 | 0.0416 |

~~CONFIDENTIAL~~

TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Continued

(e) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|---------|--------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| M = 0.60 | | | | | | M = 0.95 | | | | | |
| -3 | -0.4660 | 0.1780 | 0.0440 | 0.0644 | 0.0144 | -3 | -0.4482 | 0.2269 | 0.0443 | 0.0557 | 0.0155 |
| -2 | -0.4321 | 0.1780 | 0.0515 | 0.0618 | 0.0120 | -2 | -0.4209 | 0.2206 | 0.0572 | 0.0527 | 0.0140 |
| -1 | -0.4194 | 0.1780 | 0.0594 | 0.0580 | 0.0108 | -1 | -0.3838 | 0.2144 | 0.0642 | 0.0482 | 0.0119 |
| 0 | -0.4024 | 0.1737 | 0.0508 | 0.0567 | 0.0096 | 0 | -0.3590 | 0.2081 | 0.0572 | 0.0437 | 0.0119 |
| 1 | -0.3813 | 0.1802 | 0.0447 | 0.0515 | 0.0108 | 1 | -0.3293 | 0.2043 | 0.0662 | 0.0399 | 0.0119 |
| 2 | -0.3559 | 0.1780 | 0.0518 | 0.0490 | 0.0108 | 2 | -0.2847 | 0.2018 | 0.0610 | 0.0354 | 0.0112 |
| 3 | -0.3389 | 0.1802 | 0.0644 | 0.0451 | 0.0108 | 3 | -0.2476 | 0.1956 | 0.0613 | 0.0309 | 0.0112 |
| 5 | -0.2627 | 0.1759 | 0.0687 | 0.0232 | 0.0108 | 5 | -0.1733 | 0.1956 | 0.0687 | 0.0211 | 0.0119 |
| 7 | -0.1906 | 0.1759 | 0.0692 | 0.0271 | 0.0108 | 7 | -0.0867 | 0.1956 | 0.0764 | 0.0128 | 0.0119 |
| 10 | -0.0847 | 0.1952 | 0.0693 | 0.0129 | 0.0132 | 10 | 0.0371 | 0.2018 | 0.0742 | -0.0023 | 0.0140 |
| 20 | 0.4024 | 0.3775 | 0.0154 | -0.0490 | 0.0348 | 20 | 0.4952 | 0.3673 | 0.0102 | -0.0617 | 0.0358 |
| M = 0.80 | | | | | | M = 1.00 | | | | | |
| -3 | -0.4941 | 0.1984 | 0.0589 | 0.0622 | 0.0141 | -3 | -0.3919 | 0.2261 | 0.0144 | 0.0484 | 0.0128 |
| -2 | -0.4619 | 0.1939 | 0.0664 | 0.0596 | 0.0133 | -2 | -0.3468 | 0.2201 | 0.0227 | 0.0433 | 0.0101 |
| -1 | -0.4386 | 0.1924 | 0.0720 | 0.0560 | 0.0124 | -1 | -0.3112 | 0.2177 | 0.0289 | 0.0383 | 0.0081 |
| 0 | -0.4093 | 0.1939 | 0.0802 | 0.0533 | 0.0116 | 0 | -0.2851 | 0.2117 | 0.0235 | 0.0347 | 0.0081 |
| 1 | -0.3947 | 0.1939 | 0.0807 | 0.0489 | 0.0116 | 1 | -0.2613 | 0.2081 | 0.0199 | 0.0318 | 0.0081 |
| 2 | -0.3655 | 0.1821 | 0.0799 | 0.0462 | 0.0108 | 2 | -0.2138 | 0.2057 | 0.0237 | 0.0260 | 0.0074 |
| 3 | -0.3216 | 0.1791 | 0.0805 | 0.0418 | 0.0100 | 3 | -0.1782 | 0.2057 | 0.0305 | 0.0217 | 0.0081 |
| 5 | -0.2543 | 0.1762 | 0.0881 | 0.0338 | 0.0100 | 5 | -0.0926 | 0.2057 | 0.0419 | 0.0108 | 0.0081 |
| 7 | -0.1754 | 0.1717 | 0.0898 | 0.0240 | 0.0100 | 7 | -0.0119 | 0.2057 | 0.0452 | 0.0036 | 0.0101 |
| 10 | -0.0555 | 0.1806 | 0.0885 | 0.0089 | 0.0124 | 10 | 0.1069 | 0.2237 | 0.0524 | -0.0108 | 0.0162 |
| 20 | 0.3976 | 0.3405 | 0.0231 | -0.0489 | 0.0307 | 20 | 0.6010 | 0.4101 | -0.0281 | -0.0722 | 0.0404 |
| M = 0.85 | | | | | | M = 1.05 | | | | | |
| -3 | -0.4926 | 0.2092 | 0.0614 | 0.0624 | 0.0155 | -3 | -0.3737 | 0.2076 | 0.0092 | 0.0448 | 0.0039 |
| -2 | -0.4652 | 0.1981 | 0.0704 | 0.0582 | 0.0140 | -2 | -0.3375 | 0.2018 | 0.0164 | 0.0399 | 0.0032 |
| -1 | -0.4378 | 0.1967 | 0.0782 | 0.0558 | 0.0132 | -1 | -0.2945 | 0.1984 | 0.0162 | 0.0358 | 0.0019 |
| 0 | -0.4132 | 0.1940 | 0.0788 | 0.0524 | 0.0116 | 0 | -0.2537 | 0.1961 | 0.0241 | 0.0310 | 0.0013 |
| 1 | -0.3886 | 0.1912 | 0.0833 | 0.0491 | 0.0116 | 1 | -0.2378 | 0.1938 | 0.0117 | 0.0269 | 0.0006 |
| 2 | -0.3557 | 0.1843 | 0.0858 | 0.0449 | 0.0116 | 2 | -0.1970 | 0.1927 | 0.0171 | 0.0220 | 0.0013 |
| 3 | -0.3202 | 0.1815 | 0.0875 | 0.0399 | 0.0109 | 3 | -0.1585 | 0.1938 | 0.0232 | 0.0179 | 0.0013 |
| 5 | -0.2463 | 0.1746 | 0.0904 | 0.0316 | 0.0101 | 5 | -0.0725 | 0.1938 | 0.0348 | 0.0083 | 0.0013 |
| 7 | -0.1642 | 0.1732 | 0.0943 | 0.0216 | 0.0101 | 7 | 0.0068 | 0.1984 | 0.0385 | -0.0007 | 0.0051 |
| 10 | -0.0383 | 0.1815 | 0.0918 | 0.0067 | 0.0124 | 10 | 0.1359 | 0.2213 | 0.0443 | -0.0138 | 0.0122 |
| 20 | 0.4105 | 0.3408 | 0.0253 | -0.0508 | 0.0303 | 20 | 0.6229 | 0.4197 | -0.0441 | -0.0758 | 0.0366 |
| M = 0.90 | | | | | | M = 1.10 | | | | | |
| -3 | -0.4781 | 0.2133 | 0.0571 | 0.0597 | 0.0161 | -3 | -0.3664 | 0.1866 | 0.0161 | 0.0426 | 0.0037 |
| -2 | -0.4445 | 0.2107 | 0.0681 | 0.0558 | 0.0132 | -2 | -0.3168 | 0.1811 | 0.0163 | 0.0387 | 0.0024 |
| -1 | -0.4213 | 0.2041 | 0.0686 | 0.0527 | 0.0125 | -1 | -0.2866 | 0.1757 | 0.0151 | 0.0334 | 0.0024 |
| 0 | -0.3929 | 0.1976 | 0.0751 | 0.0495 | 0.0110 | 0 | -0.2371 | 0.1757 | 0.0189 | 0.0295 | 0.0012 |
| 1 | -0.3618 | 0.1976 | 0.0772 | 0.0448 | 0.0117 | 1 | -0.2155 | 0.1735 | 0.0157 | 0.0249 | 0.0024 |
| 2 | -0.3282 | 0.1924 | 0.0789 | 0.0417 | 0.0110 | 2 | -0.1724 | 0.1757 | 0.0241 | 0.0203 | 0.0012 |
| 3 | -0.2946 | 0.1845 | 0.0805 | 0.0369 | 0.0103 | 3 | -0.1466 | 0.1691 | 0.0175 | 0.0164 | 0.0037 |
| 5 | -0.2197 | 0.1806 | 0.0869 | 0.0275 | 0.0103 | 5 | -0.0668 | 0.1746 | 0.0357 | 0.0085 | 0.0073 |
| 7 | -0.1344 | 0.1806 | 0.0957 | 0.0189 | 0.0110 | 7 | 0.0108 | 0.1779 | 0.0347 | -0.0007 | 0.0061 |
| 10 | -0.0129 | 0.1871 | 0.0876 | 0.0047 | 0.0132 | 10 | 0.1401 | 0.2084 | 0.0397 | -0.0151 | 0.0110 |
| 20 | 0.4264 | -0.0510 | 0.0596 | -0.0527 | 0.0315 | 20 | 0.6142 | 0.4125 | -0.0470 | -0.0734 | 0.0306 |

TABLE I.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Continued

(f) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α_s , deg | c_L | c_D | c_M | c_l | c_n | α_s , deg | c_L | c_D | c_M | c_l | c_n |
|---------------------|---------|-------|-------|---------|-------|---------------------|---------|-------|---------|---------|-------|
| M = 0.60 | | | | | | M = 0.95 | | | | | |
| -3 | -0.4243 | .2256 | .1979 | .0490 | .0156 | -3 | -0.4215 | .2448 | .0744 | .0483 | .0232 |
| -2 | -0.4074 | .2192 | .0752 | .0465 | .0144 | -2 | -0.3843 | .2385 | .0835 | .0452 | .0211 |
| -1 | -0.3819 | .2170 | .0857 | .0439 | .0120 | -1 | -0.3471 | .2259 | .0836 | .0407 | .0204 |
| 0 | -0.3649 | .2148 | .0912 | .0400 | .0120 | 0 | -0.3149 | .2259 | .0794 | .0369 | .0204 |
| 1 | -0.3310 | .2385 | .0841 | -0.0916 | .0120 | 1 | -0.2802 | .2197 | .0822 | .0332 | .0197 |
| 2 | -0.3098 | .2342 | .0932 | .0361 | .0120 | 2 | -0.2454 | .2134 | .0878 | .0294 | .0190 |
| 3 | -0.2843 | .2320 | .0965 | .0323 | .0120 | 3 | -0.2033 | .2071 | .0835 | .0256 | .0190 |
| 5 | -0.2291 | .2277 | .1043 | .0245 | .0120 | 5 | -0.1364 | .2071 | .0933 | .0181 | .0190 |
| 7 | -0.1400 | .2256 | .1061 | .0168 | .0120 | 7 | -0.0694 | .2046 | .1039 | .0106 | .0197 |
| 10 | -0.0467 | .2428 | .1054 | .0052 | .0156 | 10 | .0273 | .2172 | .1136 | -0.0023 | .0211 |
| 20 | .2970 | .3717 | .0800 | -0.0452 | .0325 | 20 | .4091 | .3578 | .0598 | -0.0528 | .0380 |
| M = 0.80 | | | | | | M = 1.00 | | | | | |
| -3 | -0.4099 | .2327 | .0652 | .0481 | .0166 | -3 | -0.3877 | .2626 | .0530 | .0463 | .0236 |
| -2 | -0.3835 | .2283 | .0732 | .0454 | .0166 | -2 | -0.3568 | .2577 | .0640 | .0427 | .0223 |
| -1 | -0.3542 | .2238 | .0813 | .0418 | .0149 | -1 | -0.3187 | .2517 | .0702 | .0376 | .0209 |
| 0 | -0.3337 | .2223 | .0826 | .0392 | .0141 | 0 | -0.2973 | .2469 | .0703 | .0354 | .0202 |
| 1 | -0.3074 | .2149 | .0792 | .0347 | .0141 | 1 | -0.2545 | .2457 | .0718 | .0311 | .0202 |
| 2 | -0.2635 | .2120 | .0796 | .0320 | .0141 | 2 | -0.2165 | .2385 | .0706 | .0268 | .0202 |
| 3 | -0.2283 | .2120 | .0861 | .0276 | .0133 | 3 | -0.1879 | .2324 | .0698 | .0231 | .0202 |
| 5 | -0.1552 | .2075 | .0923 | .0187 | .0133 | 5 | -0.1094 | .2300 | .0827 | .0152 | .0196 |
| 7 | -0.0878 | .2075 | .1056 | .0107 | .0133 | 7 | -0.0357 | .2300 | .0817 | .0072 | .0216 |
| 10 | .0117 | .2223 | .1078 | -0.0009 | .0166 | 10 | .0714 | .0000 | .1028 | -0.0080 | .0236 |
| 20 | .3191 | .3409 | .0736 | -0.0454 | .0316 | 20 | .4995 | .4035 | .0252 | -0.0644 | .0439 |
| M = 0.85 | | | | | | M = 1.05 | | | | | |
| -3 | -0.4000 | .2081 | .0673 | .0458 | .0187 | -3 | -0.3651 | .2469 | .0429 | .0441 | .0212 |
| -2 | -0.3726 | .2012 | .0757 | .0425 | .0179 | -2 | -0.3289 | .2412 | .0558 | .0400 | .0187 |
| -1 | -0.3535 | .2012 | .0816 | .0392 | .0171 | -1 | -0.3016 | .2365 | .0586 | .0359 | .0180 |
| 0 | -0.3206 | .1942 | .0833 | .0367 | .0171 | 0 | -0.2631 | .2331 | .0595 | .0324 | .0174 |
| 1 | -0.2850 | .1942 | .0857 | .0325 | .0163 | 1 | -0.2313 | .2297 | .0625 | .0283 | .0161 |
| 2 | -0.2466 | .1901 | .0906 | .0283 | .0155 | 2 | -0.0816 | .2297 | .0330 | .0248 | .0167 |
| 3 | -0.2083 | .1859 | .0872 | .0242 | .0155 | 3 | -0.1633 | .2239 | .0595 | .0214 | .0167 |
| 5 | -0.1480 | .1817 | .1011 | .0183 | .0155 | 5 | -0.0907 | .2239 | .0691 | .0131 | .0187 |
| 7 | -0.0795 | .1845 | .1091 | .0100 | .0163 | 7 | -0.0113 | .2239 | .0709 | .0041 | .0199 |
| 10 | .0247 | .2025 | .1085 | -0.0025 | .0187 | 10 | .1111 | .2428 | .0757 | -0.0117 | .0225 |
| 20 | .3398 | .3316 | .0865 | -0.0467 | .0334 | 20 | .5330 | .4099 | .0041 | -0.0669 | .0431 |
| M = 0.90 | | | | | | M = 1.10 | | | | | |
| -3 | -0.4011 | .2175 | .0674 | .0464 | .0206 | -3 | -0.3475 | .2295 | .0385 | .0420 | .0196 |
| -2 | -0.3753 | .2162 | .0733 | .0441 | .0198 | -2 | -0.3129 | .2240 | .0494 | .0387 | .0184 |
| -1 | -0.3442 | .2083 | .0775 | .0394 | .0184 | -1 | -0.2870 | .2229 | .0558 | .0348 | .0165 |
| 0 | -0.3183 | .2097 | .0912 | .0370 | .0176 | 0 | -0.2525 | .2185 | .0589 | .0315 | .0153 |
| 1 | -0.2743 | .2018 | .0836 | .0331 | .0176 | 1 | -0.2158 | .2185 | .0523 | .0269 | .0153 |
| 2 | -0.2407 | .1966 | .0881 | .0291 | .0169 | 2 | -0.1856 | .2131 | .0572 | .0230 | .0159 |
| 3 | -0.2045 | .1900 | .0841 | .0244 | .0169 | 3 | -0.1489 | .2076 | .0611 | .0190 | .0196 |
| 5 | -0.1527 | .1926 | .1105 | .0165 | .0162 | 5 | -0.0734 | .2076 | .0645 | .0112 | .0184 |
| 7 | -0.0699 | .1900 | .1049 | .0094 | .0169 | 7 | .0043 | .2120 | .0642 | .0026 | .0190 |
| 10 | .0311 | .2005 | .1088 | -0.0031 | .0198 | 10 | .1209 | .2349 | .0705 | -0.0131 | .0214 |
| 20 | .3571 | .3341 | .0822 | -0.0480 | .0345 | 20 | .5309 | .3999 | -0.0056 | -0.0650 | .0398 |

~~CONFIDENTIAL~~

TABLE I.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-1 WING - Concluded

(g) $x_s/c = 0.90$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|-------|-------|---------|-------|-------------------|---------|-------|-------|------------|-------|
| $M = 0.60$ | | | | | | | | | | $M = 0.95$ | |
| -3 | -0.4617 | .1630 | .1423 | .0528 | .0240 | -3 | -0.4432 | .2119 | .1307 | .0535 | .0281 |
| -2 | -0.4194 | .1587 | .1465 | .0490 | .0216 | -2 | -0.3937 | .2056 | .1348 | .0489 | .0260 |
| -1 | -0.3855 | .1587 | .1528 | .0451 | .0204 | -1 | -0.3565 | .1993 | .1406 | .0452 | .0239 |
| 0 | -0.3559 | .1459 | .1447 | .0412 | .0180 | 0 | -0.3194 | .1931 | .1408 | .0407 | .0225 |
| 1 | -0.3135 | .1501 | .1310 | .0386 | .0180 | 1 | -0.2823 | .1893 | .1342 | .0361 | .0211 |
| 2 | -0.2711 | .1459 | .1256 | .0361 | .0180 | 2 | -0.2451 | .1805 | .1379 | .0309 | .0211 |
| 3 | -0.2372 | .1459 | .1379 | .0322 | .0180 | 3 | -0.2055 | .1830 | .1389 | .0271 | .0204 |
| 5 | -0.1737 | .1459 | .1408 | .0245 | .0180 | 5 | -0.1337 | .1805 | .1423 | .0188 | .0204 |
| 7 | -0.0932 | .1587 | .1498 | .0155 | .0180 | 7 | -0.0347 | .1868 | .1400 | .0075 | .0218 |
| 10 | .0254 | .1866 | .1408 | .0000 | .0180 | 10 | .1238 | .2081 | .1233 | -0.0113 | .0246 |
| 20 | .5126 | .4054 | .0558 | -0.0696 | .0045 | 20 | .6735 | .4275 | .0012 | -0.0851 | .0513 |
| $M = 0.80$ | | | | | | | | | | $M = 1.00$ | |
| -3 | -0.4444 | .1762 | .1271 | .0525 | .0240 | -3 | -0.4395 | .2273 | .1280 | .0542 | .0270 |
| -2 | -0.4064 | .1717 | .1373 | .0489 | .0224 | -2 | -0.3943 | .2189 | .1369 | .0491 | .0236 |
| -1 | -0.3655 | .1687 | .1395 | .0445 | .0207 | -1 | -0.3540 | .2117 | .1399 | .0448 | .0236 |
| 0 | -0.3391 | .1614 | .1281 | .0409 | .0207 | 0 | -0.3183 | .2093 | .1414 | .0412 | .0236 |
| 1 | -0.2982 | .1614 | .1335 | .0365 | .0191 | 1 | -0.2851 | .2033 | .1348 | .0361 | .0202 |
| 2 | -0.2602 | .1540 | .1316 | .0329 | .0191 | 2 | -0.2470 | .1997 | .1397 | .0318 | .0202 |
| 3 | -0.2193 | .1540 | .1296 | .0276 | .0174 | 3 | -0.2019 | .1912 | .1363 | .0275 | .0202 |
| 5 | -0.1520 | .1540 | .1384 | .0196 | .0166 | 5 | -0.1283 | .1972 | .1426 | .0181 | .0195 |
| 7 | -0.0614 | .1569 | .1437 | .0116 | .0174 | 7 | -0.0214 | .2033 | .1353 | .0065 | .0202 |
| 10 | .0848 | .1836 | .1371 | -0.0062 | .0207 | 10 | .1354 | .2273 | .1229 | -0.0137 | .0243 |
| 20 | .5877 | .3982 | .0184 | -0.0747 | .0456 | 20 | .6794 | .4559 | .0260 | -0.0867 | .0532 |
| $M = 0.85$ | | | | | | | | | | $M = 1.05$ | |
| -3 | -0.4352 | .1816 | .1287 | .0541 | .0248 | -3 | -0.4394 | .2053 | .1282 | .0530 | .0225 |
| -2 | -0.4079 | .1788 | .1364 | .0499 | .0233 | -2 | -0.3828 | .1995 | .1309 | .0482 | .0193 |
| -1 | -0.3668 | .1732 | .1407 | .0449 | .0217 | -1 | -0.3375 | .1938 | .1353 | .0434 | .0186 |
| 0 | -0.3285 | .1677 | .1303 | .0416 | .0210 | 0 | -0.3035 | .1881 | .1348 | .0386 | .0167 |
| 1 | -0.2902 | .1649 | .1315 | .0375 | .0194 | 1 | -0.2809 | .1881 | .1315 | .0344 | .0161 |
| 2 | -0.2436 | .1594 | .1345 | .0316 | .0194 | 2 | -0.2355 | .1846 | .1383 | .0310 | .0161 |
| 3 | -0.2135 | .1580 | .1301 | .0275 | .0179 | 3 | -0.2016 | .1823 | .1322 | .0262 | .0161 |
| 5 | -0.1396 | .1580 | .1394 | .0200 | .0179 | 5 | -0.1065 | .1823 | .1416 | .0165 | .0154 |
| 7 | -0.0520 | .1649 | .1442 | .0092 | .0179 | 7 | -0.0023 | .1881 | .1298 | .0041 | .0161 |
| 10 | .0985 | .1857 | .1246 | -0.0083 | .0210 | 10 | .1427 | .2236 | .1199 | -0.0138 | .0199 |
| 20 | .6186 | .4075 | .0136 | -0.0774 | .0481 | 20 | .6704 | .4541 | .0305 | -0.0847 | .0469 |
| $M = 0.90$ | | | | | | | | | | $M = 1.10$ | |
| -3 | -0.4368 | .1937 | .1268 | .0534 | .0257 | -3 | -0.4289 | .1932 | .1295 | .0511 | .0232 |
| -2 | -0.3980 | .1858 | .1335 | .0487 | .0242 | -2 | -0.3685 | .1866 | .1269 | .0446 | .0202 |
| -1 | -0.3644 | .1819 | .1317 | .0448 | .0227 | -1 | -0.3427 | .1811 | .1305 | .0413 | .0202 |
| 0 | -0.3205 | .1754 | .1387 | .0401 | .0213 | 0 | -0.3104 | .1757 | .1264 | .0374 | .0189 |
| 1 | -0.2817 | .1701 | .1297 | .0362 | .0205 | 1 | -0.2716 | .1735 | .1334 | .0341 | .0202 |
| 2 | -0.2429 | .1662 | .1300 | .0314 | .0205 | 2 | -0.2241 | .1735 | .1317 | .0295 | .0153 |
| 3 | -0.2042 | .1623 | .1306 | .0275 | .0198 | 3 | -0.1811 | .1702 | .1262 | .0243 | .0134 |
| 5 | -0.1318 | .1688 | .1477 | .0196 | .0198 | 5 | -0.0884 | .1691 | .1328 | .0131 | .0165 |
| 7 | -0.0491 | .1701 | .1429 | .0086 | .0198 | 7 | .0086 | .1790 | .1220 | .0020 | .0159 |
| 10 | .1137 | .1950 | .1254 | -0.0102 | .0235 | 10 | .1530 | .2117 | .1116 | -0.0157 | .0171 |
| 20 | .6306 | .4109 | .0098 | -0.0786 | .0498 | 20 | .6530 | .4485 | .0241 | -0.0852 | .0367 |

~~CONFIDENTIAL~~

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING

(a) Plain Wing

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|--------|-------|--------|--------|-------|-------------------|--------|-------|--------|--------|-------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -.1689 | .0167 | .0009 | .0200 | .0018 | -3 | -.2045 | .0181 | -.0179 | .0246 | .0034 |
| -2 | -.1154 | .0167 | .0012 | .0138 | .0018 | -2 | -.1356 | .0108 | -.0152 | .0159 | .0027 |
| -1 | -.0783 | .0125 | .0024 | .0088 | .0012 | -1 | -.0713 | .0084 | -.0081 | .0080 | .0024 |
| 0 | -.0206 | .0083 | .0052 | .0038 | .0012 | 0 | 0.0000 | .0096 | -.0027 | .0014 | .0020 |
| 1 | .0330 | .0167 | .0032 | -.0025 | .0012 | 1 | .0595 | .0084 | .0071 | -.0065 | .0024 |
| 2 | .0700 | .0167 | .0112 | -.0088 | .0012 | 2 | .1189 | .0120 | .0148 | -.0130 | .0027 |
| 3 | .1319 | .0209 | .0187 | -.0150 | .0012 | 3 | .1903 | .0181 | .0162 | -.0217 | .0037 |
| 5 | .2225 | .0292 | .0247 | -.0276 | .0029 | 5 | .3044 | .0349 | .0152 | -.0362 | .0061 |
| 7 | .3338 | .0522 | .0309 | -.0413 | .0058 | 7 | .4519 | .0662 | -.0037 | -.0542 | .0111 |
| 10 | .5068 | .1022 | .0241 | -.0639 | .0129 | 10 | .6136 | .1204 | -.0193 | -.0767 | .0189 |
| 20 | .7623 | .3213 | -.0890 | -.0752 | .0438 | 20 | .9871 | .3817 | -.1308 | -.1229 | .0543 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -.1937 | .0142 | -.0087 | .0222 | .0020 | -3 | -.2254 | .0254 | .0031 | .0277 | .0039 |
| -2 | -.1348 | .0128 | -.0055 | .0154 | .0020 | -2 | -.1548 | .0196 | .0013 | .0187 | .0029 |
| -1 | -.0730 | .0085 | -.0006 | .0085 | .0016 | -1 | -.0819 | .0138 | -.0010 | .0104 | .0026 |
| 0 | -.0140 | .0099 | .0035 | .0026 | .0008 | 0 | -.0068 | .0138 | .0004 | .0014 | .0023 |
| 1 | .0393 | .0114 | .0098 | -.0034 | .0020 | 1 | .0706 | .0184 | -.0011 | -.0069 | .0023 |
| 2 | .0870 | .0128 | .0159 | -.0102 | .0016 | 2 | .1366 | .0184 | -.0018 | -.0152 | .0032 |
| 3 | .1404 | .0156 | .0228 | -.0171 | .0024 | 3 | .2163 | .0254 | -.0027 | -.0242 | .0045 |
| 5 | .2527 | .0284 | .0339 | -.0299 | .0044 | 5 | .3301 | .0461 | -.0062 | -.0381 | .0074 |
| 7 | .3846 | .0554 | .0364 | -.0461 | .0076 | 7 | .4553 | .0749 | -.0223 | -.0554 | .0116 |
| 10 | .5615 | .1052 | .0221 | -.0700 | .0159 | 10 | .6488 | .1325 | -.0515 | -.0796 | .0200 |
| 20 | .7693 | .3141 | -.0874 | -.0973 | .0414 | 20 | 1.1109 | .4207 | -.1206 | -.1419 | .0604 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -.1968 | .0146 | -.0116 | .0239 | .0026 | -3 | -.2179 | .0287 | .0085 | .0265 | .0034 |
| -2 | -.1286 | .0120 | -.0067 | .0160 | .0022 | -2 | -.1416 | .0221 | .0027 | .0172 | .0025 |
| -1 | -.0656 | .0106 | -.0019 | .0088 | .0019 | -1 | -.0763 | .0177 | .0015 | .0099 | .0019 |
| 0 | -.0131 | .0106 | .0033 | .0024 | .0019 | 0 | 0.0000 | .0165 | -.0006 | .0007 | .0019 |
| 1 | .0394 | .0106 | .0085 | -.0032 | .0019 | 1 | .0741 | .0188 | -.0028 | -.0073 | .0015 |
| 2 | .1050 | .0120 | .0170 | -.0096 | .0019 | 2 | .1416 | .0232 | -.0051 | -.0152 | .0028 |
| 3 | .1312 | .0186 | .0331 | -.0176 | .0026 | 3 | .2070 | .0298 | -.0082 | -.0225 | .0040 |
| 5 | .2755 | .0319 | .0357 | -.0319 | .0045 | 5 | .3269 | .0485 | -.0148 | -.0378 | .0065 |
| 7 | .4120 | .0584 | .0318 | -.0495 | .0082 | 7 | .4467 | .0761 | -.0290 | -.0530 | .0102 |
| 10 | .5773 | .1076 | .0147 | -.0718 | .0160 | 10 | .6428 | .1346 | -.0599 | -.0775 | .0188 |
| 20 | .7977 | .3241 | -.0977 | -.1005 | .0428 | 20 | 1.1549 | .4413 | -.1530 | -.1471 | .0624 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -.1939 | .0126 | -.0188 | .0227 | .0035 | -3 | -.2051 | .0265 | .0094 | .0242 | .0024 |
| -2 | -.1292 | .0101 | -.0156 | .0151 | .0028 | -2 | -.1423 | .0212 | .0059 | .0165 | .0021 |
| -1 | -.0621 | .0076 | -.0095 | .0076 | .0021 | -1 | -.0670 | .0191 | .0010 | .0083 | .0015 |
| 0 | -.0075 | .0076 | -.0044 | .0008 | .0018 | 0 | 0.0000 | .0159 | .0006 | 0.0000 | .0012 |
| 1 | .0497 | .0088 | .0043 | -.0053 | .0021 | 1 | .0732 | .0180 | -.0032 | -.0076 | .0015 |
| 2 | .1044 | .0101 | .0127 | -.0121 | .0025 | 2 | .1360 | .0223 | -.0073 | -.0146 | .0024 |
| 3 | .1740 | .0164 | .0231 | -.0204 | .0035 | 3 | .2093 | .0297 | -.0111 | -.0229 | .0036 |
| 5 | .2908 | .0315 | .0249 | -.0340 | .0053 | 5 | .3244 | .0477 | -.0174 | -.0369 | .0062 |
| 7 | .4275 | .0591 | .0165 | -.0521 | .0095 | 7 | .4353 | .0742 | -.0295 | -.0509 | .0098 |
| 10 | .5841 | .1133 | .0001 | .1527 | .0169 | 10 | .6173 | .1271 | -.0592 | -.0732 | .0172 |
| 20 | .8576 | .3423 | -.1154 | -.1081 | .0465 | 20 | 1.1301 | .4312 | -.1572 | -.1413 | .0596 |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -.2045 | .0181 | -.0179 | .0246 | .0034 | -3 | -.2254 | .0254 | .0031 | .0277 | .0039 |
| -2 | -.1356 | .0108 | -.0152 | .0159 | .0027 | -2 | -.1548 | .0196 | .0013 | .0187 | .0029 |
| -1 | -.0713 | .0084 | -.0081 | .0080 | .0024 | -1 | -.0819 | .0138 | -.0010 | .0104 | .0026 |
| 0 | 0.0000 | .0096 | -.0027 | .0014 | .0020 | 0 | -.0068 | .0138 | .0004 | .0014 | .0023 |
| 1 | .0595 | .0084 | .0071 | -.0065 | .0024 | 1 | .0706 | .0184 | -.0011 | -.0069 | .0023 |
| 2 | .1189 | .0120 | .0148 | -.0130 | .0027 | 2 | .1366 | .0184 | -.0018 | -.0152 | .0032 |
| 3 | .1903 | .0181 | .0162 | -.0217 | .0037 | 3 | .2163 | .0254 | -.0027 | -.0242 | .0045 |
| 5 | .3044 | .0349 | .0152 | -.0362 | .0061 | 5 | .3301 | .0461 | -.0062 | -.0381 | .0074 |
| 7 | .4519 | .0662 | -.0037 | -.0542 | .0111 | 7 | .4553 | .0749 | -.0223 | -.0554 | .0116 |
| 10 | .6136 | .1204 | -.0193 | -.0767 | .0189 | 10 | .6488 | .1325 | -.0515 | -.0796 | .0200 |
| 20 | .9871 | .3817 | -.1308 | -.1229 | .0543 | 20 | 1.1109 | .4207 | -.1206 | -.1419 | .0604 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -.2254 | .0254 | .0031 | .0277 | .0039 | -3 | -.2179 | .0287 | .0085 | .0265 | .0034 |
| -2 | -.1548 | .0196 | .0013 | .0187 | .0029 | -2 | -.1416 | .0221 | .0027 | .0172 | .0025 |
| -1 | -.0819 | .0138 | -.0010 | .0104 | .0026 | -1 | -.0763 | .0177 | .0015 | .0099 | .0019 |
| 0 | 0.0000 | .0165 | -.0006 | .0007 | .0019 | 0 | 0.0000 | .0165 | -.0006 | .0007 | .0019 |
| 1 | .0741 | .0188 | -.0028 | -.0073 | .0015 | 1 | .0741 | .0188 | -.0028 | -.0073 | .0015 |
| 2 | .1416 | .0232 | -.0051 | -.0152 | .0028 | 2 | .1416 | .0232 | -.0051 | -.0152 | .0028 |
| 3 | .2070 | .0298 | -.0082 | -.0225 | .0040 | 3 | .2070 | .0298 | -.0082 | -.0225 | .0040 |
| 5 | .3269 | .0485 | -.0148 | -.0378 | .0065 | 5 | .3269 | .0485 | -.0148 | -.0378 | .0065 |
| 7 | .4467 | .0761 | -.0290 | -.0530 | .0102 | 7 | .4467 | .0761 | -.0290 | -.0530 | .0102 |
| 10 | .6428 | .1346 | -.0599 | -.0775 | .0188 | 10 | .6428 | .1346 | -.0599 | -.0775 | .0188 |
| 20 | 1.1549 | .4413 | -.1530 | -.1471 | .0624 | 20 | 1.1549 | .4413 | -.1530 | -.1471 | .0624 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -.2179 | .0287 | .0085 | .0265 | .0034 | -3 | -.2179 | .0287 | .0085 | .0265 | .0034 |
| -2 | -.1416 | .0221 | .0027 | .0172 | .0025 | -2 | -.1416 | .0221 | .0027 | .0172 | .0025 |
| -1 | -.0763 | .0177 | .0015 | .0099 | .0019 | -1 | -.0763 | .0177 | .0015 | .0099 | .0019 |
| 0 | 0.0000 | .0165 | -.0006 | .0007 | .0019 | 0 | 0.0000 | .0165 | -.0006 | .0007 | .0019 |
| 1 | .0741 | .0188 | -.0028 | -.0073 | .0015 | 1 | .0741 | .0188 | -.0028 | -.0073 | .0015 |
| 2 | .1416 | .0232 | -.0051 | -.0152 | .0028 | 2 | .1416 | .0232 | -.0051 | -.0152 | .0028 |
| 3 | .2070 | .0298 | -.0082 | -.0225 | .0040 | 3 | .2070 | .0298 | -.0082 | -.0225 | .0040 |
| 5 | .3269 | .0485 | -.0148 | -.0378 | .0065 | 5 | .3269 | .0485 | -.0148 | -.0378 | .0065 |
| 7 | .4467 | .0761 | -.0290 | -.0530 | .0102 | 7 | .4467 | .0761 | -.0290 | -.0530 | .0102 |
| 10 | .6428 | .1346 | -.0599 | -.0775 | .0188 | 10 | .6428 | .1346 | -.0599 | -.0775 | .0188 |
| 20 | 1.1549 | .4413 | -.1530 | -.1471 | .0624 | 20 | 1.1549 | .4413 | -.1530 | -.1471 | .0624 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -.2051 | .0265 | .0094 | .0242 | .0024 | -3 | -.2051 | .0265 | .0094 | .0242 | .0024 |
| -2 | -.1423 | .0212 | .0059 | .0165 | .0021 | -2 | -.1423 | .0212 | .0059 | .0165 | .0021 |
| -1 | -.0670 | .0191 | .0010 | .0083 | .0015 | -1 | -.0670 | .0191 | .0010 | .0083 | .0015 |
| 0 | 0.0000 | .0159 | .0006 | 0.0000 | .0012 | 0 | 0.0000 | .0159 | .0006 | 0.0000 | .0012 |
| 1 | .0732 | .0180 | -.0032 | -.0076 | .0015 | 1 | .0732 | .0180 | -.0032 | -.0076 | .0015 |
| 2 | .1360 | .0223 | -.0073 | -.0146 | .0024 | 2 | .1360 | .0223 | -.0073 | -.0146 | .0024 |
| 3 | .2093 | .0297 | -.0111 | -.0229 | .0036 | 3 | .2093 | .0297 | -.0111 | -.0229 | .0036 |
| 5 | .3244 | .0477 | -.0174 | -.0369 | .0062 | 5 | .3244 | .0477 | -.0174 | -.0369 | .0062 |
| 7 | .4353 | .0742 | -.0295 | -.0509 | .0098 | 7 | .4353 | .0742 | -.0295 | -.0509 | .0098 |
| 10 | .6173 | .1271 | -.0592 | -.0732 | .0172 | 10 | .6173 | .1271 | -.0592 | -.0732 | .0172 |
| 20 | 1.1301 | .4312 | -.1572 | -.1413 | .0596 | 20 | 1.1301 | .4312 | -.1572 | -.1413 | .0596 |

~~CONFIDENTIAL~~

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(b) $x_s/c = 0.30; \delta_s = -0.075; \delta_d/\delta_s = 0.75$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.3699 | 0.1664 | -0.2561 | 0.0925 | 0.0256 | -3 | -0.4264 | 0.2435 | -0.0685 | 0.0526 | 0.0336 |
| -2 | -0.3616 | 0.1664 | -0.2530 | 0.0875 | 0.0256 | -2 | -0.4027 | 0.2327 | -0.0617 | 0.0490 | 0.0322 |
| -1 | -0.3493 | 0.1727 | -0.2223 | 0.0837 | 0.0256 | -1 | -0.3648 | 0.2291 | -0.0595 | 0.0454 | 0.0312 |
| 0 | -0.3288 | 0.1727 | -0.2167 | 0.0762 | 0.0245 | 0 | -0.3388 | 0.2279 | -0.0578 | 0.0411 | 0.0306 |
| 1 | -0.3164 | 0.1768 | -0.2263 | 0.0700 | 0.0245 | 1 | -0.3222 | 0.2279 | -0.0510 | 0.0403 | 0.0299 |
| 2 | -0.2794 | 0.1768 | -0.2156 | 0.0600 | 0.0245 | 2 | -0.2961 | 0.2243 | -0.0532 | 0.0353 | 0.0292 |
| 3 | -0.2466 | 0.1789 | -0.2108 | 0.0500 | 0.0239 | 3 | -0.2724 | 0.2219 | -0.0515 | 0.0324 | 0.0282 |
| 5 | -0.1644 | 0.1852 | -0.1964 | 0.0300 | 0.0239 | 5 | -0.2037 | 0.2159 | -0.0534 | 0.0223 | 0.0275 |
| 7 | -0.0740 | 0.1873 | -0.1862 | 0.0087 | 0.0239 | 7 | -0.1256 | 0.2099 | -0.0607 | 0.0122 | 0.0269 |
| 10 | 0.0617 | 0.1997 | -0.1653 | -0.0300 | 0.0245 | 10 | 0.0853 | 0.2087 | -0.0798 | -0.0151 | 0.0262 |
| 20 | 0.4849 | 0.3121 | -0.0601 | -0.1337 | 0.0414 | 20 | 0.6515 | 0.3478 | -0.1497 | -0.0836 | 0.0480 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.4199 | 0.1956 | -0.0688 | 0.0536 | 0.0294 | -3 | -0.3150 | 0.2398 | -0.0951 | 0.0386 | 0.0328 |
| -2 | -0.4087 | 0.1941 | -0.0618 | 0.0511 | 0.0290 | -2 | -0.2787 | 0.2340 | -0.0875 | 0.0338 | 0.0318 |
| -1 | -0.3891 | 0.1941 | -0.0546 | 0.0485 | 0.0282 | -1 | -0.2266 | 0.2340 | -0.0875 | 0.0282 | 0.0308 |
| 0 | -0.3779 | 0.1956 | -0.0511 | 0.0460 | 0.0278 | 0 | -0.2107 | 0.2329 | -0.0804 | 0.0248 | 0.0305 |
| 1 | -0.3639 | 0.1956 | -0.0524 | 0.0434 | 0.0278 | 1 | -0.1858 | 0.2329 | -0.0807 | 0.0220 | 0.0302 |
| 2 | -0.3359 | 0.1941 | -0.0509 | 0.0409 | 0.0274 | 2 | -0.1473 | 0.2329 | -0.0856 | 0.0193 | 0.0302 |
| 3 | -0.2939 | 0.1927 | -0.0559 | 0.0349 | 0.0270 | 3 | -0.1020 | 0.2260 | -0.0922 | 0.0193 | 0.0296 |
| 5 | -0.2183 | 0.1913 | -0.0633 | 0.0238 | 0.0262 | 5 | -0.0295 | 0.2352 | -0.0960 | 0.0021 | 0.0296 |
| 7 | -0.1176 | 0.1941 | -0.0675 | 0.0111 | 0.0258 | 7 | 0.0113 | 0.2294 | -0.0954 | -0.0028 | 0.0286 |
| 10 | 0.0700 | 0.1984 | -0.0767 | -0.0136 | 0.0254 | 10 | 0.1722 | 0.2237 | -0.0996 | -0.0234 | 0.0283 |
| 20 | 0.5038 | 0.3118 | -0.1036 | -0.0681 | 0.0421 | 20 | 0.7432 | 0.3786 | -0.1753 | -0.0965 | 0.0537 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.4183 | 0.2012 | -0.0648 | 0.0533 | 0.0300 | -3 | -0.2929 | 0.2318 | -0.0938 | 0.0363 | 0.0305 |
| -2 | -0.4078 | 0.1985 | -0.0595 | 0.0517 | 0.0297 | -2 | -0.2452 | 0.2263 | -0.0896 | 0.0317 | 0.0295 |
| -1 | -0.3921 | 0.1998 | -0.0517 | 0.0501 | 0.0293 | -1 | -0.1974 | 0.2252 | -0.0941 | 0.0237 | 0.0283 |
| 0 | -0.3791 | 0.1998 | -0.0478 | 0.0477 | 0.0289 | 0 | -0.1562 | 0.2252 | -0.0944 | 0.0185 | 0.0280 |
| 1 | -0.3660 | 0.1985 | -0.0483 | 0.0445 | 0.0282 | 1 | -0.1150 | 0.2307 | -0.0961 | 0.0139 | 0.0274 |
| 2 | -0.3399 | 0.1985 | -0.0396 | 0.0421 | 0.0274 | 2 | -0.0759 | 0.2307 | -0.0977 | 0.0079 | 0.0283 |
| 3 | -0.3137 | 0.1985 | -0.0479 | 0.0374 | 0.0271 | 3 | -0.0434 | 0.2307 | -0.1051 | 0.0040 | 0.0277 |
| 5 | -0.2353 | 0.1959 | -0.0554 | 0.0262 | 0.0263 | 5 | 0.0369 | 0.2307 | -0.1155 | -0.0059 | 0.0280 |
| 7 | -0.1359 | 0.1946 | -0.0629 | 0.0127 | 0.0256 | 7 | 0.1237 | 0.2373 | -0.1204 | -0.0172 | 0.0289 |
| 10 | 0.0601 | 0.1972 | -0.0746 | -0.0127 | 0.0252 | 10 | 0.2820 | 0.2449 | -0.1255 | -0.0369 | 0.0314 |
| 20 | 0.5281 | 0.3110 | -0.1134 | -0.0707 | 0.0423 | 20 | 0.8353 | 0.4119 | -0.2011 | -0.1069 | 0.0585 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.4283 | 0.2156 | -0.0648 | 0.0550 | 0.0312 | -3 | -0.2834 | 0.2215 | -0.0906 | 0.0367 | 0.0275 |
| -2 | -0.4233 | 0.2131 | -0.0571 | 0.0534 | 0.0305 | -2 | -0.2292 | 0.2141 | -0.0900 | 0.0298 | 0.0263 |
| -1 | -0.4085 | 0.2131 | -0.0486 | 0.0512 | 0.0302 | -1 | -0.1834 | 0.2141 | -0.0885 | 0.0241 | 0.0257 |
| 0 | -0.3961 | 0.2156 | -0.0430 | 0.0489 | 0.0295 | 0 | -0.1396 | 0.2162 | -0.0875 | 0.0196 | 0.0248 |
| 1 | -0.3837 | 0.2118 | -0.0289 | 0.0474 | 0.0295 | 1 | 0.1042 | 0.2184 | -0.1447 | 0.0139 | 0.0236 |
| 2 | -0.3565 | 0.2118 | -0.0353 | 0.0444 | 0.0284 | 2 | -0.0688 | 0.2205 | -0.0948 | 0.0089 | 0.0248 |
| 3 | -0.3293 | 0.2081 | -0.0417 | 0.0399 | 0.0281 | 3 | -0.0271 | 0.2215 | -0.0963 | 0.0038 | 0.0257 |
| 5 | -0.2426 | 0.2056 | -0.0480 | 0.0286 | 0.0270 | 5 | 0.0479 | 0.2257 | -0.1089 | -0.0063 | 0.0260 |
| 7 | -0.1386 | 0.2031 | -0.0604 | 0.0143 | 0.0260 | 7 | 0.1354 | 0.2278 | -0.1192 | -0.0184 | 0.0278 |
| 10 | 0.0594 | 0.2005 | -0.0752 | -0.0113 | 0.0253 | 10 | 0.2917 | 0.2405 | -0.1242 | -0.0374 | 0.0293 |
| 20 | 0.5719 | 0.3259 | -0.1242 | -0.0753 | 0.0435 | 20 | 0.8334 | 0.4114 | -0.2019 | -0.1064 | 0.0573 |
| $M = 0.95$ | | | | | | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| $M = 1.05$ | | | | | | | | | | | |
| $M = 1.10$ | | | | | | | | | | | |

~~CONFIDENTIAL~~

NACA RM L57G08a

TABLE II.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(c) $x_s/c = 0.30$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|------------|--------|
| $M = 0.60$ | | | | | | | | | | $M = 0.95$ | |
| $M = 0.80$ | | | | | | | | | | $M = 1.00$ | |
| -3 | -0.3248 | 0.1977 | -0.0393 | 0.0437 | 0.0315 | -3 | -0.3175 | 0.2411 | -0.0448 | 0.0375 | 0.0349 |
| -2 | -0.3330 | 0.2040 | -0.0369 | 0.0425 | 0.0315 | -2 | -0.3104 | 0.2459 | -0.0409 | 0.0375 | 0.0356 |
| -1 | -0.3330 | 0.2081 | -0.0297 | 0.0425 | 0.0309 | -1 | -0.3128 | 0.2519 | -0.0380 | 0.0375 | 0.0356 |
| 0 | -0.3330 | 0.2102 | -0.0282 | 0.0425 | 0.0309 | 0 | -0.3175 | 0.2519 | -0.0313 | 0.0389 | 0.0356 |
| 1 | -0.3330 | 0.2123 | -0.0281 | 0.0400 | 0.0297 | 1 | -0.3223 | 0.2519 | -0.0299 | 0.0382 | 0.0356 |
| 2 | -0.3207 | 0.2102 | -0.0332 | 0.0387 | 0.0297 | 2 | -0.3223 | 0.2519 | -0.0244 | 0.0375 | 0.0356 |
| 3 | -0.3124 | 0.2144 | -0.0271 | 0.0362 | 0.0297 | 3 | -0.3033 | 0.2519 | -0.0230 | 0.0346 | 0.0349 |
| 5 | -0.2713 | 0.2164 | -0.0279 | 0.0300 | 0.0297 | 5 | -0.2488 | 0.2483 | -0.0276 | 0.0259 | 0.0339 |
| 7 | -0.2097 | 0.2185 | -0.0317 | 0.0200 | 0.0291 | 7 | -0.1683 | 0.2411 | -0.0358 | 0.0151 | 0.0329 |
| 10 | -0.0822 | 0.2185 | -0.0479 | 0.0025 | 0.0291 | 10 | -0.0332 | 0.2339 | -0.0371 | -0.0029 | 0.0319 |
| 20 | -0.3905 | 0.3143 | -0.0922 | -0.0550 | 0.0426 | 20 | -0.5047 | 0.3299 | -0.1236 | -0.0699 | 0.0464 |
| $M = 0.85$ | | | | | | | | | | $M = 1.05$ | |
| -3 | -0.3062 | 0.2199 | -0.0444 | 0.0390 | 0.0327 | -3 | -0.2970 | 0.2698 | -0.0600 | 0.0317 | 0.0383 |
| -2 | -0.3036 | 0.2239 | -0.0385 | 0.0374 | 0.0327 | -2 | -0.2517 | 0.2755 | -0.0628 | 0.0269 | 0.0379 |
| -1 | -0.3036 | 0.2252 | -0.0314 | 0.0366 | 0.0323 | -1 | -0.2290 | 0.2698 | -0.0589 | 0.0234 | 0.0379 |
| 0 | -0.3088 | 0.2265 | -0.0231 | 0.0382 | 0.0319 | 0 | -0.2063 | 0.2721 | -0.0587 | 0.0214 | 0.0373 |
| 1 | -0.3167 | 0.2265 | -0.0243 | 0.0390 | 0.0327 | 1 | -0.1723 | 0.2743 | -0.0672 | 0.0152 | 0.0370 |
| 2 | -0.3277 | 0.2269 | -0.0225 | 0.0417 | 0.0322 | 2 | -0.1496 | 0.2732 | -0.0614 | 0.0124 | 0.0367 |
| 3 | -0.3137 | 0.2269 | -0.0124 | 0.0383 | 0.0318 | 3 | -0.1383 | 0.2663 | -0.0654 | 0.0110 | 0.0360 |
| 5 | -0.2941 | 0.2255 | -0.0124 | 0.0341 | 0.0314 | 5 | -0.0476 | 0.2640 | -0.0776 | -0.0007 | 0.0357 |
| 7 | -0.2465 | 0.2198 | -0.0176 | 0.0256 | 0.0302 | 7 | -0.0023 | 0.2583 | -0.0771 | -0.0062 | 0.0341 |
| 10 | -0.0868 | 0.2127 | -0.0285 | 0.0034 | 0.0298 | 10 | -0.0884 | 0.2514 | -0.0733 | -0.0179 | 0.0341 |
| 20 | -0.4117 | 0.3035 | -0.0992 | -0.0579 | 0.0429 | 20 | -0.6213 | 0.3696 | -0.1592 | -0.0869 | 0.0534 |
| $M = 0.90$ | | | | | | | | | | $M = 1.10$ | |
| -3 | -0.3152 | 0.2387 | -0.0202 | 0.0385 | 0.0334 | -3 | -0.2736 | 0.2660 | -0.0630 | 0.0297 | 0.0351 |
| -2 | -0.3027 | 0.2249 | -0.0473 | 0.0370 | 0.0331 | -2 | -0.2301 | 0.2682 | -0.0616 | 0.0244 | 0.0333 |
| -1 | -0.2978 | 0.2312 | -0.0336 | 0.0355 | 0.0331 | -1 | -0.1976 | 0.2649 | -0.0630 | 0.0198 | 0.0342 |
| 0 | -0.3052 | 0.2387 | -0.0264 | 0.0377 | 0.0334 | 0 | -0.1650 | 0.2649 | -0.0662 | 0.0152 | 0.0342 |
| 1 | -0.3176 | 0.2374 | -0.0181 | 0.0392 | 0.0334 | 1 | -0.1390 | 0.2660 | -0.0734 | 0.0106 | 0.0226 |
| 2 | -0.3251 | 0.2362 | -0.0111 | 0.0392 | 0.0331 | 2 | -0.0999 | 0.2682 | -0.0739 | 0.0059 | 0.0333 |
| 3 | -0.3127 | 0.2324 | -0.0040 | 0.0362 | 0.0324 | 3 | -0.0651 | 0.2649 | -0.0795 | 0.0013 | 0.0333 |
| 5 | -0.2606 | 0.2249 | -0.0094 | 0.0272 | 0.0310 | 5 | -0.0022 | 0.2660 | -0.0855 | -0.0073 | 0.0329 |
| 7 | -0.2481 | 0.2211 | -0.0090 | 0.0272 | 0.0303 | 7 | -0.0825 | 0.2638 | -0.0935 | -0.0178 | 0.0333 |
| 10 | -0.1017 | 0.2186 | -0.0227 | 0.0045 | 0.0303 | 10 | -0.2062 | 0.2671 | -0.0928 | -0.0337 | 0.0351 |
| 20 | -0.4516 | 0.3141 | -0.1122 | -0.0641 | 0.0443 | 20 | -0.7468 | 0.4089 | -0.1910 | -0.1010 | 0.0573 |

~~CONFIDENTIAL~~

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(d) $x_s/c = 0.50$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.5357 | 0.1898 | -0.0252 | 0.0689 | 0.0257 | -3 | -0.5334 | 0.2496 | -0.0392 | 0.0692 | 0.0306 |
| -2 | -0.5151 | 0.1878 | -0.0115 | 0.0664 | 0.0240 | -2 | -0.4978 | 0.2424 | -0.0247 | 0.0641 | 0.0292 |
| -1 | -0.4945 | 0.1878 | -0.0024 | 0.0626 | 0.0234 | -1 | -0.4622 | 0.2400 | -0.0174 | 0.0591 | 0.0282 |
| 0 | -0.4739 | 0.1878 | -0.0002 | 0.0601 | 0.0234 | 0 | -0.4267 | 0.2364 | -0.0073 | 0.0533 | 0.0272 |
| 1 | -0.4533 | 0.1878 | 0.0007 | 0.0551 | 0.0228 | 1 | -0.3911 | 0.2340 | -0.0060 | 0.0497 | 0.0269 |
| 2 | -0.4327 | 0.1857 | 0.0028 | 0.0526 | 0.0222 | 2 | -0.3556 | 0.2280 | -0.0019 | 0.0454 | 0.0259 |
| 3 | -0.4038 | 0.1836 | 0.0097 | 0.0489 | 0.0210 | 3 | -0.3176 | 0.2220 | -0.0068 | 0.0396 | 0.0255 |
| 5 | -0.3296 | 0.1794 | 0.0114 | 0.0376 | 0.0210 | 5 | -0.2252 | 0.2100 | -0.0097 | 0.0303 | 0.0239 |
| 7 | -0.2266 | 0.1752 | 0.0106 | 0.0251 | 0.0193 | 7 | -0.0996 | 0.2040 | -0.0105 | 0.0137 | 0.0235 |
| 10 | -0.0494 | 0.1731 | 0.0105 | 0.0013 | 0.0193 | 10 | -0.0759 | 0.2040 | -0.0122 | -0.0086 | 0.0239 |
| 20 | -0.3956 | 0.3025 | -0.0496 | -0.0539 | 0.0356 | 20 | -0.4907 | 0.3180 | -0.0556 | -0.0627 | 0.0397 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.5555 | 0.2188 | -0.0154 | 0.0700 | 0.0271 | -3 | -0.4489 | 0.2525 | -0.0761 | 0.0531 | 0.0305 |
| -2 | -0.5331 | 0.2131 | -0.0022 | 0.0665 | 0.0263 | -2 | -0.3855 | 0.2468 | -0.0746 | 0.0455 | 0.0293 |
| -1 | -0.5050 | 0.2102 | 0.0055 | 0.0631 | 0.0251 | -1 | -0.3288 | 0.2434 | -0.0676 | 0.0386 | 0.0280 |
| 0 | -0.4882 | 0.2060 | 0.0177 | 0.0606 | 0.0243 | 0 | -0.2880 | 0.2411 | -0.0612 | 0.0338 | 0.0277 |
| 1 | -0.4658 | 0.2060 | 0.0190 | 0.0572 | 0.0243 | 1 | -0.2494 | 0.1263 | -0.0607 | 0.0283 | 0.0277 |
| 2 | -0.4405 | 0.2017 | 0.0259 | 0.0537 | 0.0235 | 2 | -0.2154 | 0.2376 | -0.0529 | 0.0248 | 0.0273 |
| 3 | -0.4068 | 0.1989 | 0.0323 | 0.0486 | 0.0227 | 3 | -0.1814 | 0.2319 | -0.0433 | 0.0241 | 0.0267 |
| 5 | -0.3311 | 0.1889 | 0.0352 | 0.0392 | 0.0215 | 5 | -0.1134 | 0.2181 | -0.0305 | 0.0159 | 0.0260 |
| 7 | -0.2301 | 0.1790 | 0.0398 | 0.0256 | 0.0203 | 7 | -0.0113 | 0.2147 | -0.0227 | 0.0028 | 0.0251 |
| 10 | -0.0281 | 0.1719 | 0.0331 | 0.0000 | 0.0199 | 10 | -0.1814 | 0.2181 | -0.0212 | -0.0200 | 0.0267 |
| 20 | -0.4068 | 0.2940 | -0.0375 | -0.0546 | 0.0358 | 20 | -0.5782 | 0.3444 | -0.0796 | -0.0710 | 0.0447 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.5628 | 0.2253 | -0.0170 | 0.0724 | 0.0282 | -3 | -0.4255 | 0.2429 | -0.0776 | 0.0522 | 0.0296 |
| -2 | -0.5236 | 0.2187 | -0.0050 | 0.0685 | 0.0264 | -2 | -0.3669 | 0.2363 | -0.0750 | 0.0442 | 0.0280 |
| -1 | -0.5026 | 0.2160 | 0.0093 | 0.0653 | 0.0256 | -1 | -0.3105 | 0.2341 | -0.0702 | 0.0376 | 0.0274 |
| 0 | -0.4764 | 0.2120 | 0.0173 | 0.0629 | 0.0252 | 0 | -0.2714 | 0.2319 | -0.0627 | 0.0323 | 0.0271 |
| 1 | -0.4581 | 0.2120 | 0.0206 | 0.0597 | 0.0249 | 1 | -0.2280 | 0.2308 | -0.0624 | 0.0277 | 0.0262 |
| 2 | -0.4319 | 0.2054 | 0.0292 | 0.0565 | 0.0241 | 2 | -0.1845 | 0.2308 | -0.0579 | 0.0224 | 0.0262 |
| 3 | -0.3979 | 0.2014 | 0.0352 | 0.0525 | 0.0230 | 3 | -0.1368 | 0.2264 | -0.0556 | 0.0165 | 0.0265 |
| 5 | -0.3272 | 0.1922 | 0.0400 | 0.0430 | 0.0219 | 5 | -0.0478 | 0.2220 | -0.0494 | 0.0059 | 0.0256 |
| 7 | -0.2356 | 0.1842 | 0.0456 | 0.0302 | 0.0208 | 7 | -0.0608 | 0.2187 | -0.0418 | -0.0066 | 0.0256 |
| 10 | -0.0209 | 0.1763 | 0.0391 | 0.0032 | 0.0200 | 10 | -0.2280 | 0.2231 | -0.0373 | -0.0257 | 0.0277 |
| 20 | -0.4188 | 0.2942 | -0.0379 | -0.0525 | 0.0360 | 20 | -0.6730 | 0.3792 | -0.1116 | -0.0832 | 0.0511 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.5702 | 0.2385 | -0.0174 | 0.0731 | 0.0295 | -3 | -0.4148 | 0.2374 | -0.0711 | 0.0501 | 0.0254 |
| -2 | -0.5330 | 0.2297 | -0.0056 | 0.0686 | 0.0278 | -2 | -0.3585 | 0.2290 | -0.0775 | 0.0437 | 0.0269 |
| -1 | -0.5032 | 0.2272 | 0.0055 | 0.0648 | 0.0271 | -1 | -0.3022 | 0.2258 | -0.0722 | 0.0361 | 0.0260 |
| 0 | -0.4834 | 0.2259 | 0.0169 | 0.0618 | 0.0264 | 0 | -0.2564 | 0.2248 | -0.0630 | 0.0311 | 0.0254 |
| 1 | -0.4661 | 0.2221 | 0.0219 | 0.0595 | 0.0260 | 1 | -0.2168 | 0.2248 | -0.0605 | 0.0266 | 0.0248 |
| 2 | -0.4338 | 0.2184 | 0.0281 | 0.0558 | 0.0250 | 2 | -0.1709 | 0.2216 | -0.0571 | 0.0215 | 0.0245 |
| 3 | -0.3966 | 0.2121 | 0.0352 | 0.0513 | 0.0239 | 3 | -0.1292 | 0.2205 | -0.0534 | 0.0152 | 0.0242 |
| 5 | -0.3148 | 0.2008 | 0.0407 | 0.0407 | 0.0225 | 5 | -0.0417 | 0.2162 | -0.0468 | 0.0038 | 0.0239 |
| 7 | -0.2107 | 0.1895 | 0.0451 | 0.0271 | 0.0214 | 7 | -0.0667 | 0.2110 | -0.0405 | -0.0095 | 0.0236 |
| 10 | -0.0000 | 0.1845 | 0.0371 | 0.0015 | 0.0211 | 10 | -0.2439 | 0.2216 | -0.0375 | -0.0279 | 0.0260 |
| 20 | -0.4437 | 0.3012 | -0.0447 | -0.0550 | 0.0373 | 20 | -0.6920 | 0.3852 | -0.1185 | -0.0856 | 0.0508 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.4489 | 0.2525 | -0.0761 | 0.0531 | 0.0305 | -3 | -0.4255 | 0.2429 | -0.0776 | 0.0522 | 0.0296 |
| -2 | -0.3855 | 0.2468 | -0.0746 | 0.0455 | 0.0293 | -2 | -0.3669 | 0.2363 | -0.0750 | 0.0442 | 0.0280 |
| -1 | -0.3288 | 0.2434 | -0.0676 | 0.0386 | 0.0280 | -1 | -0.3105 | 0.2341 | -0.0702 | 0.0376 | 0.0274 |
| 0 | -0.2880 | 0.2411 | -0.0612 | 0.0338 | 0.0277 | 0 | -0.2714 | 0.2319 | -0.0627 | 0.0323 | 0.0271 |
| 1 | -0.2494 | 0.1263 | -0.0607 | 0.0283 | 0.0277 | 1 | -0.2280 | 0.2308 | -0.0624 | 0.0277 | 0.0262 |
| 2 | -0.2154 | 0.2376 | -0.0529 | 0.0248 | 0.0273 | 2 | -0.1845 | 0.2308 | -0.0579 | 0.0224 | 0.0262 |
| 3 | -0.1814 | 0.2319 | -0.0433 | 0.0241 | 0.0267 | 3 | -0.1368 | 0.2264 | -0.0556 | 0.0165 | 0.0265 |
| 5 | -0.1134 | 0.2181 | -0.0305 | 0.0159 | 0.0260 | 5 | -0.0478 | 0.2220 | -0.0494 | 0.0059 | 0.0256 |
| 7 | -0.0113 | 0.2147 | -0.0227 | 0.0028 | 0.0251 | 7 | -0.0608 | 0.2187 | -0.0418 | -0.0066 | 0.0256 |
| 10 | -0.1814 | 0.2181 | -0.0212 | -0.0200 | 0.0267 | 10 | -0.2280 | 0.2231 | -0.0373 | -0.0257 | 0.0277 |
| 20 | -0.5782 | 0.3444 | -0.0796 | -0.0710 | 0.0447 | 20 | -0.6730 | 0.3792 | -0.1116 | -0.0832 | 0.0511 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.4255 | 0.2429 | -0.0776 | 0.0522 | 0.0296 | -3 | -0.4255 | 0.2429 | -0.0776 | 0.0522 | 0.0296 |
| -2 | -0.3669 | 0.2363 | -0.0750 | 0.0442 | 0.0280 | -2 | -0.3669 | 0.2363 | -0.0750 | 0.0442 | 0.0280 |
| -1 | -0.3105 | 0.2341 | -0.0702 | 0.0376 | 0.0274 | -1 | -0.3105 | 0.2341 | -0.0702 | 0.0376 | 0.0274 |
| 0 | -0.2714 | 0.2319 | -0.0627 | 0.0323 | 0.0271 | 0 | -0.2714 | 0.2319 | -0.0627 | 0.0323 | 0.0271 |
| 1 | -0.2280 | 0.2308 | -0.0624 | 0.0277 | 0.0262 | 1 | -0.2280 | 0.2308 | -0.0624 | 0.0277 | 0.0262 |
| 2 | -0.1845 | 0.2308 | -0.0579 | 0.0224 | 0.0262 | 2 | -0.1845 | 0.2308 | -0.0579 | 0.0224 | 0.0262 |
| 3 | -0.1368 | 0.2264 | -0.0556 | 0.0165 | 0.0265 | 3 | -0.1368 | 0.2264 | -0.0556 | 0.0165 | 0.0265 |
| 5 | -0.0478 | 0.2220 | -0.0494 | 0.0059 | 0.0256 | 5 | -0.0478 | 0.2220 | -0.0494 | 0.0059 | 0.0256 |
| 7 | -0.0608 | 0.2187 | -0.0418 | -0.0066 | 0.0256 | 7 | -0.0608 | 0.2187 | -0.0418 | -0.0066 | 0.0256 |
| 10 | -0.2280 | 0.2231 | -0.0373 | -0.0257 | 0.0277 | 10 | -0.2280 | 0.2231 | -0.0373 | -0.0257 | 0.0277 |
| 20 | -0.6730 | 0.3792 | -0.1116 | -0.0832 | 0.0511 | 20 | -0.6730 | 0.3792 | -0.1116 | -0.0832 | 0.0511 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.4148 | 0.2374 | -0.0711 | 0.0501 | 0.0254 | -3 | -0.4148 | 0.2374 | -0.0711 | 0.0501 | 0.0254 |
| -2 | -0.3585 | 0.2290 | -0.0775 | 0.0437 | 0.0269 | -2 | -0.3585 | 0.2290 | -0.0775 | 0.0437 | 0.0269 |
| -1 | -0.3022 | 0.2258 | -0.0722 | 0.0361 | 0.0260 | -1 | -0.3022 | 0.2258 | -0.0722 | 0.0361 | 0.0260 |
| 0 | -0.2564 | 0.2248 | -0.0630 | 0.0311 | 0.0254 | 0 | -0.2564 | 0.2248 | -0.0630 | 0.0311 | 0.0254 |
| 1 | -0.2168 | 0.2248 | -0.0605 | 0.0266 | 0.0248 | 1 | -0.2168 | 0.2248 | -0.0605 | 0.0266 | 0.0248 |
| 2 | -0.1709 | 0.2216 | -0.0571 | 0.0215 | 0.0245 | 2 | -0.1709 | 0.2216 | -0.0571 | 0.0215 | 0.0245 |
| 3 | -0.1292 | 0.2205 | -0.0534 | 0.0152 | 0.0242 | 3 | -0.1292 | 0.2205 | -0.0534 | 0.0152 | 0.0242 |
| 5 | -0.0417 | 0.2162 | -0.0468 | 0.0038 | 0.0239 | 5 | -0.0417 | 0.2162 | -0.0468 | 0.0038 | 0.0239 |
| 7 | -0.0667 | 0.2110 | -0.0405 | -0.0095 | 0.0236 | 7 | -0.0667 | 0.2110 | -0.0405 | -0.0095 | 0.0236 |
| 10 | -0.2439 | 0.2216 | -0.0375 | -0.0279 | 0.0260 | 10 | -0.2439 | 0.2216 | -0.0375 | -0.0279 | 0.0260 |
| 20 | -0.6920 | 0.3852 | -0.1185 | -0.0856 | 0.0508 | 20 | -0.6920 | 0.3852 | -0.1185 | -0.0856 | 0.0508 |

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(e) $x_S/c = 0.50$; $\delta_S = -0.075$; $\delta_d/\delta_S = 1.00$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.4769 | 0.2185 | 0.0128 | 0.0587 | 0.0286 | -3 | -0.4621 | 0.2699 | -0.0103 | 0.0569 | 0.0339 |
| -2 | -0.4604 | 0.2185 | 0.0249 | 0.0562 | 0.0280 | -2 | -0.4313 | 0.2639 | 0.0007 | 0.0533 | 0.0329 |
| -1 | -0.4522 | 0.2185 | 0.0370 | 0.0537 | 0.0268 | -1 | -0.4029 | 0.2639 | 0.0124 | 0.0504 | 0.0323 |
| 0 | -0.4358 | 0.2185 | 0.0400 | 0.0525 | 0.0268 | 0 | -0.3815 | 0.2603 | 0.0192 | 0.0483 | 0.0316 |
| 1 | -0.4234 | 0.2185 | 0.0416 | 0.0512 | 0.0274 | 1 | -0.3673 | 0.2639 | 0.0250 | 0.0454 | 0.0319 |
| 2 | -0.4070 | 0.2144 | 0.0481 | 0.0500 | 0.0262 | 2 | -0.3483 | 0.2579 | 0.0370 | 0.0425 | 0.0313 |
| 3 | -0.3905 | 0.2123 | 0.0545 | 0.0475 | 0.0257 | 3 | -0.3199 | 0.2579 | 0.0400 | 0.0389 | 0.0309 |
| 5 | -0.3371 | 0.2081 | 0.0646 | 0.0412 | 0.0251 | 5 | -0.2441 | 0.2459 | 0.0521 | 0.0303 | 0.0289 |
| 7 | -0.2549 | 0.1977 | 0.0688 | 0.0300 | 0.0233 | 7 | -0.1422 | 0.2339 | 0.0613 | 0.0166 | 0.0279 |
| 10 | -0.0987 | 0.1977 | 0.0674 | 0.0100 | 0.0227 | 10 | 0.0118 | 0.2279 | 0.0575 | -0.0014 | 0.0276 |
| 20 | 0.2672 | 0.2914 | 0.0215 | -0.0375 | 0.0338 | 20 | 0.3792 | 0.3119 | 0.0101 | -0.0461 | 0.0383 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.4482 | 0.2354 | -0.0064 | 0.0554 | 0.0290 | -3 | -0.4081 | 0.2916 | -0.0402 | 0.0483 | 0.0367 |
| -2 | -0.4286 | 0.2340 | 0.0057 | 0.0528 | 0.0286 | -2 | -0.3628 | 0.2870 | -0.0337 | 0.0448 | 0.0354 |
| -1 | -0.4117 | 0.2326 | 0.0193 | 0.0511 | 0.0278 | -1 | -0.3514 | 0.2870 | -0.0155 | 0.0407 | 0.0347 |
| 0 | -0.3921 | 0.2297 | 0.0244 | 0.0485 | 0.0274 | 0 | -0.2948 | 0.2847 | -0.0246 | 0.0345 | 0.0347 |
| 1 | -0.3753 | 0.2283 | 0.0301 | 0.0460 | 0.0274 | 1 | -0.2494 | 0.2812 | -0.0245 | 0.0296 | 0.0341 |
| 2 | -0.3613 | 0.2269 | 0.0397 | 0.0451 | 0.0270 | 2 | -0.2154 | 0.2812 | -0.0185 | 0.0248 | 0.0338 |
| 3 | -0.3417 | 0.2255 | 0.0510 | 0.0417 | 0.0266 | 3 | -0.2041 | 0.2755 | -0.0065 | 0.0221 | 0.0331 |
| 5 | -0.2885 | 0.2127 | 0.0634 | 0.0358 | 0.0250 | 5 | -0.1134 | 0.2640 | 0.0034 | 0.0124 | 0.0315 |
| 7 | -0.2101 | 0.2028 | 0.0772 | 0.0264 | 0.0238 | 7 | -0.0567 | 0.2457 | 0.0225 | 0.0055 | 0.0296 |
| 10 | -0.0532 | 0.1999 | 0.0749 | 0.0060 | 0.0234 | 10 | 0.0907 | 0.2411 | 0.0274 | 0.0565 | 0.0299 |
| 20 | 0.2801 | 0.2865 | 0.0319 | -0.0383 | 0.0346 | 20 | 0.4308 | 0.3329 | -0.0092 | -0.0538 | 0.0418 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.4449 | 0.2385 | -0.0124 | 0.0541 | 0.0297 | -3 | -0.3885 | 0.2824 | -0.0480 | 0.0436 | 0.0348 |
| -2 | -0.4109 | 0.2371 | 0.0023 | 0.0501 | 0.0289 | -2 | -0.3364 | 0.2802 | -0.0411 | 0.0383 | 0.0342 |
| -1 | -0.3952 | 0.2385 | 0.0120 | 0.0485 | 0.0289 | -1 | -0.2995 | 0.2780 | -0.0362 | 0.0337 | 0.0335 |
| 0 | -0.3768 | 0.3657 | 0.0210 | 0.0454 | 0.0282 | 0 | -0.2583 | 0.2769 | -0.0295 | 0.0290 | 0.0329 |
| 1 | -0.3585 | 0.2318 | 0.0242 | 0.0446 | 0.0282 | 1 | -0.2236 | 0.2747 | -0.0273 | 0.0251 | 0.0326 |
| 2 | -0.3402 | 0.2279 | 0.0362 | 0.0422 | 0.0278 | 2 | -0.1866 | 0.2725 | -0.0256 | 0.0205 | 0.0323 |
| 3 | -0.3271 | 0.2265 | 0.0472 | 0.0406 | 0.0271 | 3 | -0.1628 | 0.2637 | -0.0175 | 0.0172 | 0.0317 |
| 5 | -0.2748 | 0.2146 | 0.0615 | 0.0342 | 0.0252 | 5 | -0.0651 | 0.2582 | -0.0167 | 0.0053 | 0.0308 |
| 7 | -0.1963 | 0.2053 | 0.0731 | 0.0239 | 0.0241 | 7 | 0.0434 | 0.2560 | -0.0113 | -0.0079 | 0.0302 |
| 10 | -0.0393 | 0.2027 | 0.0726 | 0.0048 | 0.0241 | 10 | 0.2170 | 0.2615 | -0.0156 | -0.0271 | 0.0323 |
| 20 | 0.2879 | 0.2888 | 0.0285 | -0.0382 | 0.0349 | 20 | 0.5317 | 0.3626 | -0.0448 | -0.0673 | 0.0474 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.4459 | 0.2446 | -0.0137 | 0.0542 | 0.0309 | -3 | -0.3814 | 0.2733 | -0.0487 | 0.0412 | 0.0334 |
| -2 | -0.4162 | 0.2446 | 0.0022 | 0.0512 | 0.0302 | -2 | -0.3335 | 0.2691 | -0.0456 | 0.0355 | 0.0322 |
| -1 | -0.3914 | 0.2421 | 0.0102 | 0.0490 | 0.0299 | -1 | -0.2897 | 0.2680 | -0.0360 | 0.0311 | 0.0313 |
| 0 | -0.3716 | 0.2408 | 0.0222 | 0.0459 | 0.0292 | 0 | -0.2501 | 0.2659 | -0.0279 | 0.0260 | 0.0304 |
| 1 | -0.3567 | 0.2446 | 0.0237 | 0.0444 | 0.0295 | 1 | -0.2084 | 0.2659 | -0.0278 | 0.0190 | 0.0304 |
| 2 | -0.3419 | 0.2446 | 0.0417 | 0.0437 | 0.0292 | 2 | -0.1730 | 0.2638 | -0.0261 | 0.0146 | 0.0301 |
| 3 | -0.3220 | 0.1756 | 0.0469 | 0.0414 | 0.0285 | 3 | -0.1355 | 0.2585 | -0.0250 | 0.0095 | 0.0296 |
| 5 | -0.2651 | 0.2258 | 0.0625 | 0.0331 | 0.0267 | 5 | -0.0542 | 0.2532 | -0.0165 | -0.0006 | 0.0290 |
| 7 | -0.1858 | 0.2132 | 0.0708 | 0.0234 | 0.0249 | 7 | 0.0521 | 0.2480 | -0.0135 | -0.0133 | 0.0284 |
| 10 | -0.0322 | 0.2082 | 0.0751 | 0.0045 | 0.0249 | 10 | 0.2084 | 0.2554 | -0.0146 | -0.0317 | 0.0310 |
| 20 | 0.3097 | 0.2947 | 0.0260 | -0.0407 | 0.0362 | 20 | 0.5419 | 0.3693 | -0.0557 | -0.0748 | 0.0482 |

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(f) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| M = 0.60 | | | | | | | | | | | |
| -3 | -0.6326 | 0.1674 | 0.0514 | 0.0717 | 0.0193 | -3 | -0.5718 | 0.2099 | 0.0282 | 0.0645 | 0.0253 |
| -2 | -0.5871 | 0.1570 | 0.0602 | 0.0679 | 0.0188 | -2 | -0.5027 | 0.1990 | 0.0287 | 0.0580 | 0.0243 |
| -1 | -0.5499 | 0.1507 | 0.0665 | 0.0616 | 0.0170 | -1 | -0.4574 | 0.1869 | 0.0451 | 0.0536 | 0.0220 |
| 0 | -0.5044 | 0.1465 | 0.0706 | 0.0566 | 0.0170 | 0 | -0.3979 | 0.1821 | 0.0509 | 0.0471 | 0.0209 |
| 1 | -0.4755 | 0.1465 | 0.0674 | 0.0541 | 0.0164 | 1 | -0.3455 | 0.1809 | 0.0503 | 0.0406 | 0.0209 |
| 2 | -0.4300 | 0.1444 | 0.0726 | 0.0490 | 0.0158 | 2 | -0.2811 | 0.1749 | 0.0520 | 0.0333 | 0.0199 |
| 3 | -0.3845 | 0.1361 | 0.0757 | 0.0427 | 0.0147 | 3 | -0.2549 | 0.1628 | 0.0688 | 0.0290 | 0.0182 |
| 5 | -0.2811 | 0.1256 | 0.0789 | 0.0302 | 0.0129 | 5 | -0.1144 | 0.1592 | 0.0743 | 0.0198 | 0.0182 |
| 7 | -0.1447 | 0.1256 | 0.0841 | 0.0126 | 0.0129 | 7 | 0.0262 | 0.1604 | 0.0739 | -0.0022 | 0.0186 |
| 10 | 0.0537 | 0.1382 | 0.0687 | -0.0101 | 0.0147 | 10 | 0.2240 | 0.1761 | 0.0699 | -0.0268 | 0.0216 |
| 20 | 0.5747 | 0.3224 | -0.0192 | -0.0767 | 0.0393 | 20 | 0.6695 | 0.3389 | -0.0204 | -0.0877 | 0.0446 |
| M = 0.80 | | | | | | | | | | | |
| -3 | -0.3689 | 0.1882 | -0.0046 | 0.0762 | 0.0220 | -3 | -0.5266 | 0.2089 | 0.0073 | 0.0596 | 0.0255 |
| -2 | -0.5998 | 0.1782 | 0.0719 | 0.0719 | 0.0204 | -2 | -0.4491 | 0.1997 | 0.0030 | 0.0506 | 0.0242 |
| -1 | -0.5576 | 0.1697 | 0.0810 | 0.0634 | 0.0192 | -1 | -0.3716 | 0.1939 | 0.0019 | 0.0409 | 0.0233 |
| 0 | -0.5125 | 0.1640 | 0.0895 | 0.0582 | 0.0184 | 0 | -0.3123 | 0.3058 | 0.0092 | 0.0347 | 0.0223 |
| 1 | -0.4731 | 0.1582 | 0.0924 | 0.0557 | 0.0180 | 1 | -0.2644 | 0.1858 | 0.0111 | 0.0291 | 0.0217 |
| 2 | -0.4280 | 0.1511 | 0.0977 | 0.0505 | 0.0168 | 2 | -0.1983 | 0.1835 | 0.0141 | 0.0215 | 0.0207 |
| 3 | -0.3745 | 0.1454 | 0.1026 | 0.0445 | 0.0156 | 3 | -0.1391 | 0.1789 | 0.0222 | 0.0139 | 0.0204 |
| 5 | -0.2563 | 0.1340 | 0.1034 | 0.0300 | 0.0144 | 5 | -0.0137 | 0.1766 | 0.0289 | 0.0007 | 0.0204 |
| 7 | -0.1155 | 0.1283 | 0.1028 | 0.0154 | 0.0136 | 7 | 0.1049 | 0.1743 | 0.0395 | -0.0132 | 0.0204 |
| 10 | 0.1183 | 0.1426 | 0.0813 | -0.0128 | 0.0168 | 10 | 0.3260 | 0.2620 | 0.0250 | -0.0395 | 0.0252 |
| 20 | 0.5801 | 0.3094 | -0.0061 | -0.0754 | 0.0387 | 20 | 0.7728 | 0.3774 | -0.0365 | -0.1012 | 0.0508 |
| M = 0.85 | | | | | | | | | | | |
| -3 | -0.6393 | 0.1931 | 0.0635 | 0.0752 | 0.0224 | -3 | -0.5084 | 0.2088 | 0.0075 | 0.0557 | 0.0241 |
| -2 | -0.5893 | 0.1825 | 0.0752 | 0.0688 | 0.0213 | -2 | -0.4473 | 0.1977 | 0.0043 | 0.0484 | 0.0223 |
| -1 | -0.5446 | 0.1745 | 0.0810 | 0.0632 | 0.0198 | -1 | -0.3666 | 0.1878 | 0.0015 | 0.0391 | 0.0214 |
| 0 | -0.5236 | 0.1678 | 0.0970 | 0.0584 | 0.0190 | 0 | -0.3011 | 0.1867 | 0.0051 | 0.0325 | 0.0207 |
| 1 | -0.4604 | 0.1785 | 0.0922 | 0.0552 | 0.0187 | 1 | -0.2444 | 0.1829 | 0.0078 | 0.0259 | 0.0204 |
| 2 | -0.4052 | 0.1558 | 0.0983 | 0.0488 | 0.0172 | 2 | -0.1876 | 0.1756 | 0.0137 | 0.0192 | 0.0192 |
| 3 | -0.3499 | 0.1519 | 0.1038 | 0.0432 | 0.0160 | 3 | -0.1266 | 0.1723 | 0.0195 | 0.0126 | 0.0192 |
| 5 | -0.2368 | 0.1399 | 0.1097 | 0.0280 | 0.0146 | 5 | 0.0022 | 0.1712 | 0.0263 | -0.0020 | 0.0192 |
| 7 | -0.0974 | 0.1359 | 0.1121 | 0.0128 | 0.0146 | 7 | 0.1571 | 0.1767 | 0.0221 | -0.0186 | 0.0207 |
| 10 | 0.1368 | 0.1452 | 0.0844 | -0.0144 | 0.0175 | 10 | 0.3579 | 0.2077 | 0.0103 | -0.0431 | 0.0254 |
| 20 | 0.5972 | 0.3090 | -0.0063 | -0.0768 | 0.0388 | 20 | 0.8532 | 0.4165 | -0.0553 | -0.1081 | 0.0554 |
| M = 0.90 | | | | | | | | | | | |
| -3 | -0.6179 | 0.2018 | 0.0545 | 0.0720 | 0.0237 | -3 | -0.4923 | 0.2004 | 0.0089 | 0.0554 | 0.0232 |
| -2 | -0.5606 | 0.1917 | 0.0638 | 0.0652 | 0.0219 | -2 | -0.4336 | 0.1898 | 0.0057 | 0.0484 | 0.0217 |
| -1 | -0.5058 | 0.1829 | 0.0715 | 0.0598 | 0.0208 | -1 | -0.3624 | 0.1803 | 0.0041 | 0.0408 | 0.0205 |
| 0 | -0.4659 | 0.1766 | 0.0796 | 0.0538 | 0.0201 | 0 | -0.2912 | 0.1761 | 0.0048 | 0.0325 | 0.0199 |
| 1 | -0.4211 | 0.1703 | 0.0823 | 0.0492 | 0.0191 | 1 | -0.2346 | 0.1729 | 0.0068 | 0.0268 | 0.0187 |
| 2 | -0.3662 | 0.1652 | 0.0880 | 0.0439 | 0.0184 | 2 | -0.1801 | 0.1686 | 0.0113 | 0.0204 | 0.0184 |
| 3 | -0.3065 | 0.1577 | 0.0918 | 0.0371 | 0.0170 | 3 | -0.1173 | 0.1676 | 0.0183 | 0.0134 | 0.0181 |
| 5 | -0.1918 | 0.1463 | 0.0983 | 0.0227 | 0.0166 | 5 | 0.0021 | 0.1644 | 0.0258 | -0.0006 | 0.0181 |
| 7 | -0.0598 | 0.1438 | 0.1052 | 0.0076 | 0.0163 | 7 | 0.1529 | 0.1707 | 0.0214 | -0.0178 | 0.0199 |
| 10 | 0.1545 | 0.1526 | 0.0871 | -0.0174 | 0.0184 | 10 | 0.3498 | 0.2015 | 0.0095 | -0.0414 | 0.0244 |
| 20 | 0.6179 | 0.3166 | -0.0113 | -0.0795 | 0.0583 | 20 | 0.8400 | 0.4125 | -0.0539 | -0.1045 | 0.0544 |
| M = 1.00 | | | | | | | | | | | |
| -3 | -0.5266 | 0.2089 | 0.0073 | 0.0596 | 0.0255 | -3 | -0.5084 | 0.2088 | 0.0075 | 0.0557 | 0.0241 |
| -2 | -0.4491 | 0.1997 | 0.0030 | 0.0506 | 0.0242 | -2 | -0.4473 | 0.1977 | 0.0043 | 0.0484 | 0.0223 |
| -1 | -0.3716 | 0.1939 | 0.0019 | 0.0409 | 0.0233 | -1 | -0.3666 | 0.1878 | 0.0015 | 0.0391 | 0.0214 |
| 0 | -0.3123 | 0.3058 | 0.0092 | 0.0325 | 0.0223 | 0 | -0.3011 | 0.1867 | 0.0051 | 0.0325 | 0.0207 |
| 1 | -0.2644 | 0.1858 | 0.0111 | 0.0291 | 0.0217 | 1 | -0.2444 | 0.1829 | 0.0078 | 0.0259 | 0.0204 |
| 2 | -0.1983 | 0.1835 | 0.0141 | 0.0215 | 0.0207 | 2 | -0.1876 | 0.1756 | 0.0137 | 0.0192 | 0.0192 |
| 3 | -0.1391 | 0.1789 | 0.0222 | 0.0139 | 0.0204 | 3 | -0.1266 | 0.1723 | 0.0195 | 0.0126 | 0.0192 |
| 5 | -0.0137 | 0.1766 | 0.0289 | 0.0007 | 0.0204 | 5 | 0.0022 | 0.1712 | 0.0263 | -0.0020 | 0.0192 |
| 7 | 0.1049 | 0.1743 | 0.0395 | -0.0132 | 0.0204 | 7 | 0.1571 | 0.1767 | 0.0221 | -0.0186 | 0.0207 |
| 10 | 0.3260 | 0.2620 | 0.0250 | -0.0395 | 0.0252 | 10 | 0.3579 | 0.2077 | 0.0103 | -0.0431 | 0.0254 |
| 20 | 0.7728 | 0.3774 | -0.0365 | -0.1012 | 0.0508 | 20 | 0.8532 | 0.4165 | -0.0553 | -0.1081 | 0.0554 |
| M = 1.05 | | | | | | | | | | | |
| -3 | -0.5084 | 0.2088 | 0.0075 | 0.0557 | 0.0241 | -3 | -0.5084 | 0.2088 | 0.0075 | 0.0557 | 0.0241 |
| -2 | -0.4473 | 0.1977 | 0.0043 | 0.0484 | 0.0223 | -2 | -0.4473 | 0.1977 | 0.0043 | 0.0484 | 0.0223 |
| -1 | -0.3666 | 0.1878 | 0.0015 | 0.0391 | 0.0214 | -1 | -0.3666 | 0.1878 | 0.0015 | 0.0391 | 0.0214 |
| 0 | -0.3011 | 0.1867 | 0.0051 | 0.0325 | 0.0207 | 0 | -0.3011 | 0.1867 | 0.0051 | 0.0325 | 0.0207 |
| 1 | -0.2444 | 0.1829 | 0.0078 | 0.0259 | 0.0204 | 1 | -0.2444 | 0.1829 | 0.0078 | 0.0259 | 0.0204 |
| 2 | -0.1876 | 0.1756 | 0.0137 | 0.0192 | 0.0192 | 2 | -0.1876 | 0.1756 | 0.0137 | 0.0192 | 0.0192 |
| 3 | -0.1266 | 0.1723 | 0.0195 | 0.0126 | 0.0192 | 3 | -0.1266 | 0.1723 | 0.0195 | 0.0126 | 0.0192 |
| 5 | 0.0022 | 0.1712 | 0.0263 | -0.0020 | 0.0192 | 5 | 0.0022 | 0.1712 | 0.0263 | -0.0020 | 0.0192 |
| 7 | 0.1571 | 0.1767 | 0.0221 | -0.0186 | 0.0207 | 7 | 0.1571 | 0.1767 | 0.0221 | -0.0186 | 0.0207 |
| 10 | 0.3579 | 0.2077 | 0.0103 | -0.0431 | 0.0254 | 10 | 0.3579 | 0.2077 | 0.0103 | -0.0431 | 0.0254 |
| 20 | 0.8532 | 0.4165 | -0.0553 | -0.1081 | 0.0554 | 20 | 0.8532 | 0.4165 | -0.0553 | -0.1081 | 0.0554 |
| M = 1.10 | | | | | | | | | | | |
| -3 | -0.4923 | 0.2004 | 0.0089 | 0.0554 | 0.0232 | -3 | -0.4923 | 0.2004 | 0.0089 | 0.0554 | 0.0232 |
| -2 | -0.4336 | 0.1898 | 0.0057 | 0.0484 | 0.0217 | -2 | -0.4336 | 0.1898 | 0.0057 | 0.0484 | 0.0217 |
| -1 | -0.3624 | 0.1803 | 0.0041 | 0.0408 | 0.0205 | -1 | -0.3624 | 0.1803 | 0.0041 | 0.0408 | 0.0205 |
| 0 | -0.2912 | 0.1761 | 0.0048 | 0.0325 | 0.0199 | 0 | -0.2912 | 0.1761 | 0.0048 | 0.0325 | 0.0199 |
| 1 | -0.2346 | 0.1729 | 0.0068 | 0.0268 | 0.0187 | 1 | -0.2346 | 0.1729 | 0.0068 | 0.0268 | 0.0187 |
| 2 | -0.1801 | 0.1686 | 0.0113 | 0.0204 | 0.0184 | 2 | -0.1801 | 0.1686 | 0.0113 | 0.0204 | 0.0184 |
| 3 | -0.1173 | 0.1676 | 0.0183 | 0.0134 | 0.0181 | 3 | -0.1173 | 0.1676 | 0.0183 | 0.0134 | 0.0181 |
| 5 | 0.0021 | 0.1644 | 0.0258 | -0.0006 | 0.0181 | 5 | 0.0021 | 0.1644 | 0.0258 | -0.0006 | 0.0181 |
| 7 | 0.1529 | 0.1707 | 0.0214 | -0.0178 | 0.0199 | 7 | 0.1529 | 0.1707 | 0.0214 | -0.0178 | 0.0199 |
| 10 | 0.3498 | 0.2015 | 0.0095 | -0.0414 | 0.0244 | 10 | 0.3498 | 0.2015 | 0.0095 | -0.0414 | 0.0244 |
| 20 | 0.8400 | 0.4125 | -0.0539 | -0.1045 | 0.0544 | 20 | 0.8400 | 0.4125 | -0.0539 | -0.1045 | 0.0544 |

~~CONFIDENTIAL~~

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(g) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α_s deg | C_L | C_D | C_M | C_l | C_n | α_s deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|--------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.5944 | 0.1964 | 0.0656 | 0.0728 | 0.0228 | -3 | -0.6119 | 0.2447 | 0.0561 | 0.0717 | 0.0304 |
| -2 | -0.5655 | 0.1901 | 0.0795 | 0.0690 | 0.0222 | -2 | -0.5500 | 0.2362 | 0.0629 | 0.0652 | 0.0287 |
| -1 | -0.5448 | 0.1839 | 0.0793 | 0.0653 | 0.0217 | -1 | -0.4928 | 0.2302 | 0.0676 | 0.0586 | 0.0273 |
| 0 | -0.5159 | 0.1797 | 0.0320 | 0.0627 | 0.0199 | 0 | -0.4500 | 0.2182 | 0.0792 | 0.0536 | 0.0263 |
| 1 | -0.4870 | 0.1776 | 0.0955 | 0.0590 | 0.0205 | 1 | -0.4047 | 0.2146 | 0.0817 | 0.0492 | 0.0250 |
| 2 | -0.4499 | 0.1734 | 0.0959 | 0.0540 | 0.0193 | 2 | -0.3500 | 0.2061 | 0.0889 | 0.0420 | 0.0240 |
| 3 | -0.4127 | 0.1714 | 0.1054 | 0.0502 | 0.0187 | 3 | -0.2833 | 0.2013 | 0.0861 | 0.0340 | 0.0230 |
| 5 | -0.3054 | 0.1609 | 0.1130 | 0.0376 | 0.0164 | 5 | -0.1714 | 0.1941 | 0.0998 | 0.0224 | 0.0216 |
| 7 | -0.1981 | 0.1546 | 0.1184 | 0.0251 | 0.0152 | 7 | -0.0405 | 0.1880 | 0.1009 | 0.0065 | 0.0213 |
| 10 | -0.0206 | 0.1630 | 0.1111 | 0.0038 | 0.0164 | 10 | 0.1500 | 0.2001 | 0.0883 | -0.0174 | 0.0226 |
| 20 | 0.3591 | 0.2967 | 0.0530 | -0.0515 | 0.0328 | 20 | 0.4905 | 0.3327 | 0.0402 | -0.0644 | 0.0385 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.6073 | 0.2078 | 0.0639 | 0.0727 | 0.0255 | -3 | -0.5581 | 0.2457 | 0.0278 | 0.0644 | 0.0300 |
| -2 | -0.5595 | 0.1993 | 0.0723 | 0.0675 | 0.0239 | -2 | -0.4829 | 0.2376 | 0.0272 | 0.0561 | 0.0288 |
| -1 | -0.5257 | 0.1936 | 0.0827 | 0.0633 | 0.0227 | -1 | -0.4260 | 0.2295 | 0.0291 | 0.0499 | 0.0271 |
| 0 | -0.4836 | 0.1893 | 0.0871 | 0.0581 | 0.0219 | 0 | -0.3759 | 0.2260 | 0.0379 | 0.0436 | 0.0262 |
| 1 | -0.4470 | 0.1836 | 0.0912 | 0.0539 | 0.0215 | 1 | -0.3235 | 0.2226 | 0.0385 | 0.0381 | 0.0255 |
| 2 | -0.4076 | 0.1751 | 0.0995 | 0.0496 | 0.0203 | 2 | -0.2665 | 0.2168 | 0.0424 | 0.0312 | 0.0242 |
| 3 | -0.3599 | 0.1722 | 0.1065 | 0.0445 | 0.0195 | 3 | -0.2027 | 0.2088 | 0.0511 | 0.0229 | 0.0233 |
| 5 | -0.2502 | 0.1580 | 0.1100 | 0.0316 | 0.0179 | 5 | -0.0843 | 0.2053 | 0.0592 | 0.0104 | 0.0229 |
| 7 | -0.1321 | 0.1580 | 0.1169 | 0.0180 | 0.0171 | 7 | 0.0410 | 0.2030 | 0.0632 | -0.0035 | 0.0226 |
| 10 | 0.0647 | 0.1694 | 0.1002 | -0.0068 | 0.0187 | 10 | 0.2187 | 0.2203 | 0.0640 | -0.0256 | 0.0249 |
| 20 | 0.3739 | 0.2932 | 0.0601 | -0.0513 | 0.0331 | 20 | 0.6060 | 0.3725 | 0.0047 | -0.0790 | 0.0446 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.6021 | 0.2143 | 0.0612 | 0.0727 | 0.0261 | -3 | -0.5451 | 0.2407 | 0.0258 | 0.0623 | 0.0278 |
| -2 | -0.5337 | 0.2037 | 0.0652 | 0.0664 | 0.0250 | -2 | -0.4732 | 0.2296 | 0.0238 | 0.0544 | 0.0283 |
| -1 | -0.5180 | 0.1983 | 0.0841 | 0.0624 | 0.0048 | -1 | -0.4012 | 0.2219 | 0.0281 | 0.0451 | 0.0247 |
| 0 | -0.4733 | 0.1903 | 0.0904 | 0.0568 | 0.0224 | 0 | -0.3467 | 0.2175 | 0.0318 | 0.0404 | 0.0241 |
| 1 | -0.4391 | 0.1864 | 0.0943 | 0.0528 | 0.0216 | 1 | -0.3096 | 0.2142 | 0.0350 | 0.0351 | 0.0235 |
| 2 | -0.3944 | 0.1810 | 0.0991 | 0.0480 | 0.0209 | 2 | -0.2551 | 0.2108 | 0.0406 | 0.0285 | 0.0223 |
| 3 | -0.3365 | 0.1744 | 0.1038 | 0.0424 | 0.0198 | 3 | -0.1897 | 0.2020 | 0.0478 | 0.0219 | 0.0213 |
| 5 | -0.2340 | 0.1637 | 0.1135 | 0.0304 | 0.0183 | 5 | -0.0632 | 0.1987 | 0.0535 | 0.0073 | 0.0210 |
| 7 | -0.1052 | 0.1624 | 0.1153 | 0.0152 | 0.0179 | 7 | 0.0741 | 0.1998 | 0.0530 | -0.0093 | 0.0216 |
| 10 | 0.0999 | 0.1770 | 0.0964 | -0.0112 | 0.0198 | 10 | 0.2682 | 0.2252 | 0.0431 | -0.0325 | 0.0257 |
| 20 | 0.3944 | 0.2995 | 0.0611 | -0.0536 | 0.0343 | 20 | 0.6825 | 0.3930 | -0.0225 | -0.0875 | 0.0489 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.6247 | 0.2256 | 0.0650 | 0.0734 | 0.0279 | -3 | -0.5382 | 0.2332 | 0.0291 | 0.0611 | 0.0261 |
| -2 | -0.5650 | 0.2155 | 0.0735 | 0.0674 | 0.0265 | -2 | -0.4754 | 0.2205 | 0.0270 | 0.0535 | 0.0246 |
| -1 | -0.5227 | 0.2092 | 0.0815 | 0.0621 | 0.0254 | -1 | -0.4083 | 0.2131 | 0.0269 | 0.0465 | 0.0235 |
| 0 | -0.4754 | 0.2029 | 0.0911 | 0.0568 | 0.0240 | 0 | -0.3497 | 0.2089 | 0.0318 | 0.0401 | 0.0226 |
| 1 | -0.4306 | 0.1953 | 0.0928 | 0.0522 | 0.0229 | 1 | -0.2974 | 0.2078 | 0.0353 | 0.0337 | 0.0220 |
| 2 | -0.3858 | 0.1890 | 0.0997 | 0.0477 | 0.0219 | 2 | -0.2429 | 0.2025 | 0.0396 | 0.0267 | 0.0214 |
| 3 | -0.3211 | 0.1777 | 0.1030 | 0.0401 | 0.0205 | 3 | -0.1864 | 0.1972 | 0.0468 | 0.0210 | 0.0208 |
| 5 | -0.2165 | 0.1739 | 0.1141 | 0.0280 | 0.0194 | 5 | -0.0628 | 0.1930 | 0.0524 | 0.0070 | 0.0202 |
| 7 | -0.0846 | 0.1676 | 0.1168 | 0.0129 | 0.0187 | 7 | 0.0859 | 0.1961 | 0.0459 | -0.0108 | 0.0208 |
| 10 | 0.1170 | 0.1840 | 0.0927 | -0.0129 | 0.0205 | 10 | 0.2618 | 0.2237 | 0.0400 | -0.0325 | 0.0246 |
| 20 | 0.4306 | 0.3138 | 0.0565 | -0.0583 | 0.0360 | 20 | 0.6869 | 0.3986 | -0.0315 | -0.0891 | 0.0493 |

TABLE II.-- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(h) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|-------|-------|---------|-------|-------------------|---------|-------|---------|---------|-------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.5084 | .2197 | .0315 | .0616 | .0246 | -3 | -0.5573 | .2725 | .0394 | .0630 | .0317 |
| -2 | -0.4712 | .2197 | .0387 | .0578 | .0240 | -2 | -0.5073 | .2653 | .0477 | .0572 | .0311 |
| -1 | -0.4381 | .2155 | .0457 | .0540 | .0229 | -1 | -0.4620 | .2580 | .0553 | .0521 | .0294 |
| 0 | -0.4133 | .2092 | .0513 | .0503 | .0229 | 0 | -0.4120 | .2472 | .0630 | .0471 | .0277 |
| 1 | -0.3844 | .2134 | .0536 | .0465 | .0229 | 1 | -0.3739 | .2496 | .0724 | .0427 | .0277 |
| 2 | -0.3472 | .2092 | .0595 | .0415 | .0217 | 2 | -0.3310 | .2472 | .0765 | .0377 | .0274 |
| 3 | -0.3182 | .2092 | .0675 | .0390 | .0211 | 3 | -0.2739 | .2399 | .0773 | .0311 | .0267 |
| 5 | -0.2273 | .2030 | .0788 | .0276 | .0199 | 5 | -0.1453 | .2339 | .0831 | .0196 | .0257 |
| 7 | -0.1446 | .2030 | .0875 | .0163 | .0193 | 7 | -0.0595 | .2291 | .0977 | .0065 | .0253 |
| 10 | .0000 | .2092 | .0915 | .0000 | .0199 | 10 | .1096 | .2363 | .0853 | -0.0152 | .0260 |
| 20 | .2810 | .3243 | .0751 | -0.0415 | .0334 | 20 | .4287 | .3557 | .0574 | -0.0608 | .0419 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.5067 | .2309 | .0271 | .0599 | .0267 | -3 | -0.5445 | .2849 | .0255 | .0603 | .0339 |
| -2 | -0.4645 | .2266 | .0386 | .0539 | .0255 | -2 | -0.4852 | .2768 | .0325 | .0533 | .0326 |
| -1 | -0.4279 | .2209 | .0419 | .0496 | .0248 | -1 | -0.4374 | .2710 | .0410 | .0485 | .0313 |
| 0 | -0.3885 | .2195 | .0522 | .0454 | .0236 | 0 | -0.3873 | .2676 | .0471 | .0429 | .0307 |
| 1 | -0.3519 | .2166 | .0540 | .0411 | .0240 | 1 | -0.3417 | .1499 | .0490 | .0374 | .0304 |
| 2 | -0.3097 | .2138 | .0613 | .0368 | .0232 | 2 | -0.2848 | .2607 | .0530 | .0312 | .0291 |
| 3 | -0.2674 | .2095 | .0680 | .0317 | .0228 | 3 | -0.2278 | .2537 | .0549 | .0242 | .0281 |
| 5 | -0.1689 | .1995 | .0756 | .0197 | .0212 | 5 | -0.1253 | .2457 | .0653 | .0139 | .0275 |
| 7 | -0.0704 | .1981 | .0824 | .0077 | .0208 | 7 | -0.0159 | .2422 | .0742 | -0.0007 | .0275 |
| 10 | .0844 | .2138 | .0762 | -0.0103 | .0224 | 10 | .1549 | .2572 | .0673 | -0.0208 | .0294 |
| 20 | .3603 | .1867 | .0750 | -0.0514 | .0367 | 20 | .5035 | .3864 | .0309 | -0.0686 | .0465 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.5129 | .2343 | .0266 | .0592 | .0272 | -3 | -0.5233 | .2716 | .0232 | .0577 | .0331 |
| -2 | -0.4682 | .2290 | .0381 | .0536 | .0261 | -2 | -0.4666 | .2661 | .0274 | .0511 | .0315 |
| -1 | -0.4261 | .2224 | .0648 | .0488 | .0250 | -1 | -0.4187 | .2605 | .0344 | .0464 | .0303 |
| 0 | -0.3814 | .2197 | .0520 | .0440 | .0242 | 0 | -0.3707 | .2583 | .0421 | .0404 | .0294 |
| 1 | -0.3498 | .2170 | .0534 | .0400 | .0246 | 1 | -0.3227 | .2539 | .0479 | .0351 | .0291 |
| 2 | -0.3077 | .2130 | .0618 | .0352 | .0235 | 2 | -0.2726 | .2484 | .0482 | .0305 | .0284 |
| 3 | -0.2578 | .2077 | .0668 | .0296 | .0231 | 3 | -0.2202 | .2429 | .0530 | .0232 | .0275 |
| 5 | -0.1578 | .2024 | .0754 | .0176 | .0216 | 5 | -0.1112 | .2373 | .0615 | .0113 | .0263 |
| 7 | -0.0526 | .2011 | .0806 | .0056 | .0213 | 7 | .0174 | .2362 | .0617 | -0.0040 | .0263 |
| 10 | .1026 | .1491 | .0771 | -0.0128 | .0235 | 10 | .1941 | .2572 | .0538 | -0.0245 | .0294 |
| 20 | .3814 | .3329 | .0592 | -0.0528 | .0373 | 20 | .5342 | .3886 | .0151 | -0.0729 | .0473 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.5303 | .2433 | .0277 | .0598 | .0282 | -3 | -0.5233 | .2597 | .0233 | .0579 | .0318 |
| -2 | -0.4830 | .2395 | .0357 | .0538 | .0272 | -2 | -0.4606 | .2533 | .0248 | .0509 | .0303 |
| -1 | -0.4357 | .2307 | .0472 | .0492 | .0258 | -1 | -0.3915 | .2480 | .0287 | .0439 | .0291 |
| 0 | -0.3909 | .2294 | .0538 | .0447 | .0254 | 0 | -0.3517 | .2448 | .0346 | .0395 | .0282 |
| 1 | -0.3486 | .2256 | .0596 | .0394 | .0247 | 1 | -0.2973 | .2427 | .0433 | .0325 | .0270 |
| 2 | -0.3112 | .2244 | .0647 | .0348 | .0244 | 2 | -0.2512 | .2363 | .0449 | .0280 | .0267 |
| 3 | -0.2614 | .2143 | .0674 | .0288 | .0233 | 3 | -0.1968 | .2310 | .0520 | .0204 | .0255 |
| 5 | -0.1544 | .2080 | .0772 | .0174 | .0226 | 5 | -0.0984 | .2279 | .0581 | .0089 | .0252 |
| 7 | -0.0548 | .2067 | .0895 | .0053 | .0222 | 7 | .0377 | .2279 | .0563 | -0.0064 | .0252 |
| 10 | .1120 | .2206 | .0735 | -0.0144 | .0240 | 10 | .1989 | .2469 | .0498 | -0.0267 | .0285 |
| 20 | .4009 | .3403 | .0585 | -0.0560 | .0392 | 20 | .6008 | .4070 | -0.0125 | -0.0802 | .0502 |

~~CONFIDENTIAL~~

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Continued

(i) $x_s/c = 0.90$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|------------|--------|
| $M = 0.60$ | | | | | | | | | | $M = 0.95$ | |
| -3 | -0.5959 | 0.1768 | 0.1224 | 0.0700 | 0.0256 | -3 | -0.6161 | 0.2243 | 0.1302 | 0.0757 | 0.0309 |
| -2 | -0.5342 | 0.1685 | 0.1247 | 0.0637 | 0.0245 | -2 | -0.5450 | 0.2123 | 0.1348 | 0.0670 | 0.0286 |
| -1 | -0.4932 | 0.1664 | 0.1275 | 0.0575 | 0.0227 | -1 | -0.4858 | 0.2040 | 0.1369 | 0.0605 | 0.0276 |
| 0 | -0.4438 | 0.1644 | 0.1305 | 0.0537 | 0.0221 | 0 | -0.4384 | 0.1980 | 0.1394 | 0.0540 | 0.0269 |
| 1 | -0.4110 | 0.1602 | 0.1284 | 0.0487 | 0.0221 | 1 | -0.3792 | 0.1944 | 0.1437 | 0.0490 | 0.0259 |
| 2 | -0.3699 | 0.1560 | 0.1312 | 0.0437 | 0.0216 | 2 | -0.2962 | 0.1800 | 0.1420 | 0.0382 | 0.0239 |
| 3 | -0.3082 | 0.1560 | 0.1404 | 0.0375 | 0.0204 | 3 | -0.2370 | 0.1920 | 0.1528 | 0.0331 | 0.0252 |
| 5 | -0.1973 | 0.1456 | 0.1344 | 0.0237 | 0.0192 | 5 | -0.0948 | 0.1884 | 0.1521 | 0.0187 | 0.0249 |
| 7 | -0.0699 | 0.1498 | 0.1345 | 0.0100 | 0.0186 | 7 | 0.0592 | 0.1884 | 0.1400 | -0.0007 | 0.0245 |
| 10 | 0.1233 | 0.1810 | 0.1169 | -0.0125 | 0.0216 | 10 | 0.2962 | 0.2171 | 0.1033 | -0.0303 | 0.0286 |
| 20 | 0.5959 | 0.3745 | 0.0004 | -0.0800 | 0.0466 | 20 | 0.7583 | 0.4199 | -0.0271 | -0.0958 | 0.0551 |
| $M = 0.80$ | | | | | | | | | | $M = 1.00$ | |
| -3 | -0.5906 | 0.1885 | 0.1186 | 0.0706 | 0.0262 | -3 | -0.6347 | 0.2410 | 0.2707 | 0.0786 | 0.0328 |
| -2 | -0.5374 | 0.1800 | 0.1218 | 0.0647 | 0.0250 | -2 | -0.5485 | 0.2295 | 0.1384 | 0.0689 | 0.0312 |
| -1 | -0.4787 | 0.1715 | 0.1282 | 0.0579 | 0.0238 | -1 | -0.4873 | 0.2203 | 0.1406 | 0.0620 | 0.0296 |
| 0 | -0.4227 | 0.1701 | 0.1292 | 0.0511 | 0.0234 | 0 | -0.4261 | 0.2123 | 0.1477 | 0.0551 | 0.0286 |
| 1 | -0.3835 | 0.1658 | 0.1304 | 0.0460 | 0.0226 | 1 | -0.3740 | 0.2066 | 0.1465 | 0.0489 | 0.0273 |
| 2 | -0.3275 | 0.1573 | 0.1352 | 0.0400 | 0.0218 | 2 | -0.3015 | 0.1985 | 0.1465 | 0.0400 | 0.0264 |
| 3 | -0.2547 | 0.1545 | 0.1336 | 0.0323 | 0.0210 | 3 | -0.2380 | 0.1962 | 0.1519 | 0.0338 | 0.0257 |
| 5 | -0.1260 | 0.1488 | 0.1378 | 0.0179 | 0.0202 | 5 | -0.0907 | 0.1962 | 0.1483 | 0.0179 | 0.0254 |
| 7 | -0.0084 | 0.1559 | 0.1360 | 0.0043 | 0.0202 | 7 | 0.0680 | 0.2054 | 0.1321 | -0.0014 | 0.0264 |
| 10 | 0.2239 | 0.1899 | 0.1011 | -0.0247 | 0.0250 | 10 | 0.3128 | 0.2352 | 0.0979 | -0.0324 | 0.0312 |
| 20 | 0.6690 | 0.3755 | -0.0194 | -0.0868 | 0.0488 | 20 | 0.7842 | 0.4498 | -0.0135 | -0.0979 | 0.0595 |
| $M = 0.85$ | | | | | | | | | | $M = 1.05$ | |
| -3 | -0.5888 | 0.1921 | 0.1180 | 0.0700 | 0.0267 | -3 | -0.6229 | 0.2318 | 0.1476 | 0.0779 | 0.0311 |
| -2 | -0.5260 | 0.1828 | 0.1235 | 0.0637 | 0.0256 | -2 | -0.5448 | 0.2198 | 0.1410 | 0.0680 | 0.0295 |
| -1 | -0.4710 | 0.1749 | 0.1295 | 0.0573 | 0.0245 | -1 | -0.4666 | 0.2110 | 0.1387 | 0.0601 | 0.0283 |
| 0 | -0.4187 | 0.1722 | 0.1318 | 0.0517 | 0.0238 | 0 | -0.4124 | 0.2033 | 0.1426 | 0.0528 | 0.0268 |
| 1 | -0.3690 | 0.1656 | 0.1296 | 0.0462 | 0.0226 | 1 | -0.3473 | 0.1956 | 0.1387 | 0.0455 | 0.0252 |
| 2 | -0.3140 | 0.1590 | 0.1349 | 0.0398 | 0.0219 | 2 | -0.2778 | 0.1901 | 0.1436 | 0.0383 | 0.0246 |
| 3 | -0.2408 | 0.1537 | 0.1350 | 0.0310 | 0.0208 | 3 | -0.2062 | 0.1879 | 0.1437 | 0.0304 | 0.0243 |
| 5 | -0.1282 | 0.1524 | 0.1399 | 0.0183 | 0.0204 | 5 | -0.0651 | 0.1868 | 0.1372 | 0.0152 | 0.0240 |
| 7 | 0.0183 | 0.1590 | 0.1386 | 0.0024 | 0.0212 | 7 | 0.1042 | 0.1989 | 0.1167 | -0.0053 | 0.0252 |
| 10 | 0.2460 | 0.1921 | 0.0973 | -0.0255 | 0.0252 | 10 | 0.3104 | 0.2362 | 0.0899 | -0.0323 | 0.0302 |
| 20 | 0.6804 | 0.3789 | -0.0202 | -0.0883 | 0.0497 | 20 | 0.7922 | 0.4692 | -0.0016 | -0.0977 | 0.0606 |
| $M = 0.90$ | | | | | | | | | | $M = 1.10$ | |
| -3 | -0.5946 | 0.2007 | 0.1198 | 0.0723 | 0.0278 | -3 | -0.6105 | 0.2215 | 0.1495 | 0.0754 | 0.0295 |
| -2 | -0.5326 | 0.1906 | 0.1244 | 0.0648 | 0.0263 | -2 | -0.5417 | 0.2110 | 0.1441 | 0.0684 | 0.0281 |
| -1 | -0.4757 | 0.1881 | 0.1336 | 0.0588 | 0.0253 | -1 | -0.4667 | 0.2004 | 0.1438 | 0.0596 | 0.0263 |
| 0 | -0.4212 | 0.1781 | 0.1330 | 0.0512 | 0.0242 | 0 | -0.4021 | 0.1909 | 0.1413 | 0.0526 | 0.0251 |
| 1 | -0.3716 | 0.1718 | 0.1338 | 0.0467 | 0.0235 | 1 | -0.3438 | 0.1857 | 0.1405 | 0.0462 | 0.0242 |
| 2 | -0.2973 | 0.1643 | 0.1353 | 0.0377 | 0.0218 | 2 | -0.2750 | 0.1814 | 0.1399 | 0.0380 | 0.0236 |
| 3 | -0.2353 | 0.1631 | 0.1398 | 0.0309 | 0.0218 | 3 | -0.1979 | 0.1793 | 0.1433 | 0.0298 | 0.0233 |
| 5 | -0.1041 | 0.1631 | 0.1436 | 0.0173 | 0.0218 | 5 | -0.0417 | 0.1793 | 0.1260 | 0.0120 | 0.0230 |
| 7 | 0.0297 | 0.1668 | 0.1365 | 0.0023 | 0.0218 | 7 | 0.1042 | 0.1899 | 0.1082 | -0.0057 | 0.0242 |
| 10 | 0.2700 | 0.2007 | 0.1050 | -0.0279 | 0.0263 | 10 | 0.3021 | 0.2268 | 0.0819 | -0.0310 | 0.0290 |
| 20 | 0.7184 | 0.3951 | -0.0252 | -0.0927 | 0.0516 | 20 | 0.7709 | 0.4536 | -0.0043 | -0.0950 | 0.0582 |

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-2 WING - Concluded

(j) $x_S/c = 0.90$; $\delta_S = -0.075$; $\delta_d/\delta_S = 1.00$

| α_j deg | c_L | c_D | c_M | c_l | c_n | α_j deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|-------|---------|---------|-------|-------------------|---------|-------|---------|---------|-------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.5248 | •1930 | •0865 | •0636 | •0291 | -3 | -0.5790 | •2513 | •0983 | •0675 | •0349 |
| -2 | -0.4756 | •1889 | •0906 | •0573 | •0273 | -2 | -0.5081 | •2393 | •0973 | •0589 | •0328 |
| -1 | -0.4305 | •1847 | •0969 | •0524 | •0262 | -1 | -0.4538 | •2273 | •1045 | •0532 | •0315 |
| 0 | -0.3895 | •1827 | •0974 | •0461 | •0262 | 0 | -0.3900 | •2237 | •1074 | •0467 | •0302 |
| 1 | -0.3526 | •1827 | •0884 | •0424 | •0256 | 1 | -0.3427 | •2214 | •1078 | •0410 | •0298 |
| 2 | -0.3034 | •1806 | •1017 | •0374 | •0244 | 2 | -0.2789 | •2118 | •1109 | •0331 | •0285 |
| 3 | -0.2624 | •1785 | •0976 | •0324 | •0238 | 3 | -0.2080 | •2094 | •1133 | •0259 | •0278 |
| 5 | -0.1517 | •1723 | •1005 | •0187 | •0233 | 5 | -0.0874 | •2034 | •1166 | •0122 | •0268 |
| 7 | -0.0410 | •1764 | •1000 | •0062 | •0233 | 7 | -0.0473 | •2058 | •1109 | -0.0022 | •0271 |
| 10 | -0.1394 | •2055 | •0887 | -0.0137 | •0256 | 10 | -0.2600 | •2357 | •0825 | -0.0295 | •0315 |
| 20 | -0.5822 | •3944 | -0.0237 | -0.0798 | •0494 | 20 | -0.7374 | •4307 | -0.0467 | -0.0963 | •0576 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.5447 | •2107 | •0880 | •0646 | •0301 | -3 | -0.5993 | •2690 | •1057 | •0694 | •0372 |
| -2 | -0.4861 | •2022 | •0905 | •0586 | •0289 | -2 | -0.5178 | •2599 | •1032 | •0605 | •0359 |
| -1 | -0.4330 | •1952 | •0958 | •0518 | •0273 | -1 | -0.4523 | •2519 | •1060 | •0529 | •0343 |
| 0 | -0.3743 | •1923 | •0991 | •0459 | •0269 | 0 | -0.3889 | •2461 | •1099 | •0461 | •0334 |
| 1 | -0.3380 | •1909 | •0978 | •0408 | •0265 | 1 | -0.3437 | •2427 | •1133 | •0413 | •0327 |
| 2 | -0.2794 | •1881 | •1026 | •0348 | •0257 | 2 | -0.2714 | •2313 | •1132 | •0323 | •0311 |
| 3 | -0.2151 | •1810 | •1021 | •0272 | •0246 | 3 | -0.2148 | •2290 | •1170 | •0268 | •0305 |
| 5 | -0.0978 | •1768 | •1096 | •0136 | •0238 | 5 | -0.0905 | •2175 | •1190 | •0131 | •0292 |
| 7 | •0223 | •1796 | •1070 | •0008 | •0238 | 7 | •0475 | •2290 | •1115 | -0.0034 | •0305 |
| 10 | •0219 | •2121 | •0786 | -0.0229 | •0281 | 10 | •2714 | •2587 | •0801 | -0.0309 | •0346 |
| 20 | •6425 | •3960 | -0.0317 | -0.0841 | •0515 | 20 | •7915 | •4751 | -0.0304 | -0.1024 | •0635 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.5535 | •2168 | •0892 | •0659 | •0307 | -3 | -0.5890 | •2609 | •1080 | •0691 | •0365 |
| -2 | -0.4908 | •2062 | •0908 | •0587 | •0292 | -2 | -0.5153 | •2521 | •1036 | •0593 | •0350 |
| -1 | -0.4308 | •2009 | •0976 | •0524 | •0281 | -1 | -0.4331 | •2412 | •1015 | •0514 | •0338 |
| 0 | -0.3812 | •1969 | •1004 | •0468 | •0274 | 0 | -0.3789 | •2379 | •1098 | •0454 | •0322 |
| 1 | -0.3290 | •1943 | •1048 | •0413 | •0267 | 1 | -0.3270 | •2335 | •1080 | •0395 | •0313 |
| 2 | -0.2794 | •1903 | •1046 | •0341 | •0259 | 2 | -0.2598 | •2247 | •1144 | •0309 | •0301 |
| 3 | -0.2089 | •1824 | •1016 | •0254 | •0252 | 3 | -0.1927 | •2203 | •1148 | •0244 | •0298 |
| 5 | -0.0862 | •1811 | •1096 | •0127 | •0241 | 5 | -0.0650 | •2203 | •1125 | •0099 | •0295 |
| 7 | •0366 | •1850 | •1051 | -0.0008 | •0248 | 7 | •0693 | •2291 | •1018 | -0.0053 | •0301 |
| 10 | •0271 | •2141 | •0794 | -0.0254 | •0285 | 10 | •2880 | •2631 | •0709 | -0.0336 | •0347 |
| 20 | •6736 | •4031 | -0.0393 | -0.0881 | •0529 | 20 | •7708 | •4878 | -0.0229 | -0.1001 | •0639 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.5635 | •2290 | •0912 | •0661 | •0319 | -3 | -0.5899 | •2517 | •1123 | •0666 | •0508 |
| -2 | -0.4943 | •2190 | •0922 | •0586 | •0305 | -2 | -0.5162 | •2421 | •1075 | •0577 | •0344 |
| -1 | -0.4424 | •2102 | •0997 | •0519 | •0291 | -1 | -0.4424 | •2347 | •1057 | •0493 | •0329 |
| 0 | -0.3831 | •2040 | •1027 | •0466 | •0280 | 0 | -0.3687 | •2261 | •1069 | •0410 | •0314 |
| 1 | -0.3337 | •2002 | •0998 | •0398 | •0277 | 1 | -0.3160 | •2240 | •1104 | •0352 | •0305 |
| 2 | -0.2743 | •1977 | •1048 | •0338 | •0266 | 2 | -0.2444 | •2133 | •1099 | •0269 | •0299 |
| 3 | -0.2076 | •1914 | •1060 | •0256 | •0259 | 3 | -0.1896 | •2112 | •1111 | •0205 | •0290 |
| 5 | -0.0915 | •1877 | •1120 | •0128 | •0252 | 5 | -0.0632 | •2133 | •1083 | •0064 | •0284 |
| 7 | •0470 | •1902 | •1042 | -0.0015 | •0256 | 7 | •0948 | •2240 | •0905 | -0.0122 | •0290 |
| 10 | •2422 | •2252 | •0861 | -0.0271 | •0298 | 10 | •2907 | •2560 | •0646 | -0.0372 | •0338 |
| 20 | •7044 | •4129 | -0.0439 | -0.0924 | •0547 | 20 | •7585 | •4800 | -0.0218 | -0.1012 | •0618 |

TABLE III.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-3 WING

(a) Plain Wing

| α , deg | C_L | C_D | C_M | C_l | C_n | | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|--|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | | |
| $M = 0.95$ | | | | | | | | | | | | |
| -3 | -0.2129 | 0.0056 | -0.0086 | 0.0247 | 0.0013 | | -3 | -0.2837 | 0.0210 | -0.0020 | 0.0317 | 0.0029 |
| -2 | -0.1466 | 0.0042 | -0.0059 | 0.0174 | 0.0010 | | -2 | -0.2072 | 0.0113 | -0.0016 | 0.0207 | 0.0018 |
| -1 | -0.0774 | 0.0028 | 0.0007 | 0.0090 | 0.0005 | | -1 | -0.0924 | 0.0065 | -0.0014 | 0.0100 | 0.0015 |
| 0 | -0.0194 | 0.0014 | 0.0049 | 0.0022 | 0.0005 | | 0 | -0.0048 | 0.0065 | -0.008 | -0.0006 | 0.0015 |
| 1 | 0.0442 | 0.0028 | 0.0014 | -0.0056 | 0.0005 | | 1 | 0.1004 | 0.0073 | 0.0039 | -0.0126 | 0.0018 |
| 2 | 0.1079 | 0.0042 | 0.0070 | -0.0135 | 0.0010 | | 2 | 0.1833 | 0.0121 | 0.0076 | -0.0223 | 0.0026 |
| 3 | 0.1742 | 0.0098 | 0.0121 | -0.0219 | 0.0016 | | 3 | 0.2725 | 0.0202 | 0.0052 | -0.0333 | 0.0036 |
| 5 | 0.3097 | 0.0252 | 0.0199 | -0.0376 | 0.0034 | | 5 | 0.4382 | 0.0468 | -0.0160 | -0.0539 | 0.0077 |
| 7 | 0.4480 | 0.0504 | 0.0265 | -0.0549 | 0.0073 | | 7 | 0.6088 | 0.0855 | -0.0490 | -0.0753 | 0.0137 |
| 10 | 0.6333 | 0.1134 | -0.0061 | -0.0807 | 0.0167 | | 10 | 0.8223 | 0.1525 | -0.0785 | -0.1014 | 0.0238 |
| 20 | 0.7577 | 0.3052 | -0.0888 | -0.0998 | 0.0413 | | 20 | 1.0040 | 0.3856 | -0.1463 | -0.1273 | 0.0530 |
| $M = 0.80$ | | | | | | | | | | | | |
| $M = 1.00$ | | | | | | | | | | | | |
| -3 | -0.2486 | 0.0105 | -0.0147 | 0.0283 | 0.0021 | | -3 | -0.2820 | 0.0293 | 0.0188 | 0.0321 | 0.0039 |
| -2 | -0.1695 | 0.0048 | -0.0088 | 0.0187 | 0.0012 | | -2 | -0.1799 | 0.0201 | 0.0110 | 0.0201 | 0.0027 |
| -1 | -0.0848 | 0.0010 | -0.0062 | 0.0099 | 0.0009 | | -1 | -0.0899 | 0.0139 | 0.0055 | 0.0096 | 0.0022 |
| 0 | -0.0151 | 0.0000 | -0.0015 | 0.0015 | 0.0007 | | 0 | 0.0030 | 0.0139 | 0.0026 | -0.0009 | 0.0022 |
| 1 | 0.0546 | 0.0019 | 0.0075 | -0.0073 | 0.0011 | | 1 | 0.1021 | 0.0154 | -0.0004 | -0.0127 | 0.0026 |
| 2 | 0.1281 | 0.0057 | 0.0128 | -0.0160 | 0.0016 | | 2 | 0.1875 | 0.0201 | -0.0052 | -0.0232 | 0.0035 |
| 3 | 0.2185 | 0.0124 | 0.0190 | -0.0263 | 0.0021 | | 3 | 0.2728 | 0.0293 | -0.0109 | -0.0340 | 0.0048 |
| 5 | 0.3786 | 0.0296 | 0.0315 | -0.0454 | 0.0048 | | 5 | 0.4207 | 0.0525 | -0.0266 | -0.0507 | 0.0082 |
| 7 | 0.5406 | 0.0601 | 0.0274 | -0.0657 | 0.0098 | | 7 | 0.5670 | 0.0849 | -0.0487 | -0.0689 | 0.0133 |
| 10 | 0.7120 | 0.1211 | 0.0091 | -0.0894 | 0.0182 | | 10 | 0.7835 | 0.1528 | -0.0886 | -0.0961 | 0.0229 |
| 20 | 0.7949 | 0.3128 | -0.0970 | -0.1020 | 0.0426 | | | | | | | |
| $M = 0.85$ | | | | | | | | | | | | |
| $M = 1.05$ | | | | | | | | | | | | |
| -3 | -0.2657 | 0.0125 | -0.0157 | 0.0293 | 0.0022 | | -3 | -0.2597 | 0.0397 | 0.0105 | 0.0294 | 0.0032 |
| -2 | -0.1725 | 0.0062 | -0.0119 | 0.0186 | 0.0015 | | -2 | -0.1813 | 0.0309 | 0.0026 | 0.0203 | 0.0023 |
| -1 | -0.0862 | 0.0018 | -0.0080 | 0.0086 | 0.0010 | | -1 | -0.1045 | 0.0264 | 0.0002 | 0.0118 | 0.0018 |
| 0 | -0.0106 | 0.0000 | -0.0002 | 0.0000 | 0.0008 | | 0 | -0.0290 | 0.0235 | 0.0004 | 0.0029 | 0.0015 |
| 1 | 0.0686 | 0.0036 | 0.0100 | -0.0093 | 0.0012 | | 1 | 0.0464 | 0.0250 | 0.0017 | -0.0056 | 0.0018 |
| 2 | 0.1426 | 0.0071 | 0.0209 | -0.0186 | 0.0017 | | 2 | 0.1306 | 0.0286 | 0.0017 | -0.0159 | 0.0023 |
| 3 | 0.3273 | 0.0125 | 0.0018 | -0.0296 | 0.0025 | | 3 | 0.1988 | 0.0345 | -0.0014 | -0.0235 | 0.0032 |
| 5 | 0.4171 | 0.0339 | 0.0239 | -0.0507 | 0.0060 | | 5 | 0.3264 | 0.0521 | -0.0175 | -0.0385 | 0.0058 |
| 7 | 0.5667 | 0.0668 | 0.0149 | -0.0696 | 0.0111 | | 7 | 0.4700 | 0.0779 | -0.0395 | -0.0556 | 0.0097 |
| 10 | 0.7409 | 0.1292 | -0.0010 | -0.0931 | 0.0196 | | 10 | 0.6789 | 0.1373 | -0.0753 | -0.0818 | 0.0182 |
| 20 | 0.8254 | 0.3252 | -0.1055 | -0.1056 | 0.0441 | | | | | | | |
| $M = 0.90$ | | | | | | | | | | | | |
| $M = 1.10$ | | | | | | | | | | | | |
| -3 | -0.2832 | 0.0169 | -0.0153 | 0.0314 | 0.0024 | | -3 | -0.2689 | 0.0409 | 0.0173 | 0.0305 | 0.0032 |
| -2 | -0.1799 | 0.0067 | -0.0165 | 0.0196 | 0.0016 | | -2 | -0.1909 | 0.0324 | 0.0110 | 0.0215 | 0.0021 |
| -1 | -0.0850 | 0.0025 | -0.0068 | 0.0084 | 0.0011 | | -1 | -0.1073 | 0.0261 | 0.0051 | 0.0119 | 0.0014 |
| 0 | -0.0017 | 0.0025 | 0.0013 | -0.0014 | 0.0011 | | 0 | -0.0237 | 0.0226 | 0.0032 | 0.0025 | 0.0014 |
| 1 | 0.0800 | 0.0034 | 0.0122 | -0.0111 | 0.0013 | | 1 | 0.0543 | 0.0254 | 0.0003 | -0.0068 | 0.0017 |
| 2 | 0.1583 | 0.0067 | 0.0218 | -0.0196 | 0.0019 | | 2 | 0.1254 | 0.0282 | -0.0023 | -0.0150 | 0.0021 |
| 3 | 0.2582 | 0.0152 | 0.0248 | -0.0317 | 0.0030 | | 3 | 0.2048 | 0.0346 | -0.0087 | -0.0246 | 0.0032 |
| 5 | 0.4348 | 0.0388 | 0.0083 | -0.0530 | 0.0066 | | 5 | 0.3288 | 0.0515 | -0.0191 | -0.0390 | 0.0057 |
| 7 | 0.6148 | 0.0784 | -0.0175 | -0.0756 | 0.0126 | | 7 | 0.6506 | 0.1319 | -0.0719 | -0.0785 | 0.0171 |
| 10 | 0.7864 | 0.1417 | -0.0344 | -0.1003 | 0.0219 | | | | | | | |
| 20 | 0.8897 | 0.3441 | -0.0730 | -0.1121 | 0.0468 | | | | | | | |

~~CONFIDENTIAL~~

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-3 WING - Continued

$$(b) \quad x_s/c = 0.30; \quad \delta_s = -0.075; \quad \delta_d/\delta_s = 0.75$$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.4451 | 0.1750 | -0.0683 | 0.0538 | 0.0254 | -3 | -0.5020 | 0.2558 | -0.0675 | 0.0607 | 0.0334 |
| -2 | -0.4423 | 0.1764 | -0.0658 | 0.0527 | 0.0251 | -2 | -0.4621 | 0.2477 | -0.0695 | 0.0543 | 0.0324 |
| -1 | -0.4285 | 0.1820 | -0.0622 | 0.0510 | 0.0251 | -1 | -0.4303 | 0.2396 | -0.0621 | 0.0510 | 0.0312 |
| 0 | -0.4147 | 0.1820 | -0.0548 | 0.0476 | 0.0254 | 0 | -0.3586 | 0.2420 | -0.0641 | 0.0423 | 0.0312 |
| 1 | -0.3870 | 0.1889 | -0.0472 | 0.0454 | 0.0254 | 1 | -0.2868 | 0.2437 | -0.1197 | 0.0333 | 0.0319 |
| 2 | -0.3677 | 0.1876 | -0.0528 | 0.0409 | 0.0251 | 2 | -0.3028 | 0.2356 | -0.0623 | 0.0355 | 0.0304 |
| 3 | -0.3318 | 0.1862 | -0.0534 | 0.0364 | 0.0251 | 3 | -0.2550 | 0.2340 | -0.0664 | 0.0300 | 0.0304 |
| 5 | -0.1465 | 0.1889 | -0.0712 | 0.0118 | 0.0248 | 5 | -0.2072 | 0.2299 | -0.0671 | 0.0220 | 0.0294 |
| 7 | 0.0193 | 0.1988 | -0.0820 | -0.0095 | 0.0254 | 7 | -0.1195 | 0.2219 | -0.0774 | 0.0116 | 0.0286 |
| 10 | 0.4921 | 0.3079 | -0.0805 | -0.0701 | 0.0408 | 10 | 0.0797 | 0.2178 | -0.0893 | -0.0145 | 0.0285 |
| | | | | | | 20 | 0.6853 | 0.3493 | -0.1543 | -0.0888 | 0.0469 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.4708 | 0.2002 | -0.0574 | 0.0584 | 0.0280 | -3 | -0.3963 | 0.2547 | -0.0854 | 0.0460 | 0.0333 |
| -2 | -0.4689 | 0.2002 | -0.0549 | 0.0576 | 0.0274 | -2 | -0.3430 | 0.2469 | -0.0954 | 0.0399 | 0.0321 |
| -1 | -0.4576 | 0.1992 | -0.0496 | 0.0561 | 0.0271 | -1 | -0.2896 | 0.2415 | -0.0949 | 0.0318 | 0.0313 |
| 0 | -0.4331 | 0.2002 | -0.0444 | 0.0527 | 0.0271 | 0 | -0.2134 | 0.2400 | -0.0967 | 0.0256 | 0.0311 |
| 1 | -0.4143 | 0.2002 | -0.0395 | 0.0496 | 0.0271 | 1 | -0.1722 | 0.2431 | -0.0988 | 0.0198 | 0.0385 |
| 2 | -0.3954 | 0.2002 | -0.0372 | 0.0470 | 0.0269 | 2 | -0.1601 | 0.2408 | -0.0921 | 0.0170 | 0.0316 |
| 3 | -0.3785 | 0.2002 | -0.0335 | 0.0443 | 0.0265 | 3 | -0.1524 | 0.2369 | -0.0900 | 0.0167 | 0.0310 |
| 5 | -0.3145 | 0.1954 | -0.0366 | 0.0355 | 0.0258 | 5 | -0.0610 | 0.2392 | -0.1047 | 0.0000 | 0.0313 |
| 7 | -0.2071 | 0.1954 | -0.0473 | 0.0214 | 0.0255 | 7 | 0.0381 | 0.2408 | -0.1114 | -0.0077 | 0.0317 |
| 10 | 0.0264 | 0.1907 | -0.0727 | -0.0095 | 0.0255 | 10 | 0.1982 | 0.2292 | -0.1121 | -0.0275 | 0.0304 |
| 20 | 0.5367 | 0.3070 | -0.1076 | -0.0733 | 0.0418 | 20 | 0.7469 | 0.3704 | -0.1680 | -0.0949 | 0.0496 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.4785 | 0.2138 | -0.0598 | 0.0599 | 0.0289 | -3 | -0.3649 | 0.2438 | -0.0857 | 0.0426 | 0.0312 |
| -2 | -0.4750 | 0.2066 | -0.0542 | 0.0585 | 0.0283 | -2 | -0.3094 | 0.2350 | -0.0957 | 0.0364 | 0.0299 |
| -1 | -0.4574 | 0.2066 | -0.0496 | 0.0567 | 0.0279 | -1 | -0.2481 | 0.2291 | -0.0983 | 0.0293 | 0.0291 |
| 0 | -0.4398 | 0.2093 | -0.0401 | 0.0539 | 0.0278 | 0 | -0.1970 | 0.2291 | -0.0956 | 0.0231 | 0.0290 |
| 1 | -0.4222 | 0.2093 | -0.0381 | 0.0335 | 0.0278 | 1 | -0.1606 | 0.2328 | -0.0968 | 0.0183 | 0.0293 |
| 2 | -0.4134 | 0.2093 | -0.0319 | 0.0496 | 0.0276 | 2 | -0.1168 | 0.2350 | -0.1007 | 0.0124 | 0.0295 |
| 3 | -0.3906 | 0.2049 | -0.0277 | 0.0460 | 0.0269 | 3 | -0.1460 | 0.2365 | -0.0850 | 0.0068 | 0.0299 |
| 5 | -0.3343 | 0.2022 | -0.0313 | 0.0378 | 0.0264 | 5 | 0.0219 | 0.2387 | -0.1189 | -0.0050 | 0.0299 |
| 7 | -0.2217 | 0.1968 | -0.0484 | 0.0232 | 0.0259 | 7 | 0.1124 | 0.2438 | -0.1276 | -0.0160 | 0.0309 |
| 10 | 0.0299 | 0.1942 | -0.0709 | -0.0093 | 0.0256 | 10 | 0.3050 | 0.2490 | -0.1369 | -0.0399 | 0.0320 |
| 20 | 0.5718 | 0.3162 | -0.1195 | -0.0767 | 0.0429 | 20 | 0.7736 | 0.3621 | -0.1780 | -0.0967 | 0.0486 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.5165 | 0.2319 | -0.0661 | 0.0652 | 0.0312 | -3 | -0.3503 | 0.2341 | -0.0811 | 0.0412 | 0.0293 |
| -2 | -0.5448 | 0.2362 | -0.0566 | 0.0659 | 0.0315 | -2 | -0.2985 | 0.2256 | -0.0919 | 0.0349 | 0.0281 |
| -1 | -0.4998 | 0.2319 | -0.0512 | 0.0608 | 0.0306 | -1 | -0.2480 | 0.2199 | -0.0957 | 0.0290 | 0.0274 |
| 0 | -0.4715 | 0.2311 | -0.0429 | 0.0567 | 0.0301 | 0 | -0.1892 | 0.2199 | -0.0918 | 0.0222 | 0.0266 |
| 1 | -0.4498 | 0.2286 | -0.0410 | 0.0544 | 0.0299 | 1 | -0.1541 | 0.2235 | -0.0946 | 0.0173 | 0.0268 |
| 2 | -0.4165 | 0.2235 | -0.0386 | 0.0507 | 0.0293 | 2 | -0.1121 | 0.2270 | -0.0967 | 0.0116 | 0.0270 |
| 3 | -0.3832 | 0.2235 | -0.0377 | 0.0449 | 0.0288 | 3 | -0.0631 | 0.2270 | -0.1012 | 0.0060 | 0.0273 |
| 5 | -0.2949 | 0.2168 | -0.0469 | 0.0331 | 0.0282 | 5 | 0.0140 | 0.2306 | -0.1124 | -0.0045 | 0.0277 |
| 7 | -0.1999 | 0.2083 | -0.0522 | 0.0213 | 0.0268 | 7 | 0.1093 | 0.2355 | -0.1217 | -0.0159 | 0.0286 |
| 10 | 0.0333 | 0.1999 | -0.0737 | -0.0091 | 0.0260 | 10 | 0.2802 | 0.2412 | -0.1316 | -0.0375 | 0.0297 |
| 20 | 0.6048 | 0.3247 | -0.1317 | -0.0800 | 0.0436 | 20 | 0.7707 | 0.3015 | -0.1728 | -0.0815 | 0.0427 |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -0.5020 | 0.2558 | -0.0675 | 0.0607 | 0.0334 | -3 | -0.3963 | 0.2547 | -0.0854 | 0.0460 | 0.0333 |
| -2 | -0.4621 | 0.2477 | -0.0695 | 0.0543 | 0.0324 | -2 | -0.3430 | 0.2469 | -0.0954 | 0.0399 | 0.0321 |
| -1 | -0.4303 | 0.2396 | -0.0621 | 0.0510 | 0.0312 | -1 | -0.2896 | 0.2415 | -0.0949 | 0.0318 | 0.0313 |
| 0 | -0.3586 | 0.2420 | -0.0641 | 0.0423 | 0.0312 | 0 | -0.2134 | 0.2400 | -0.0967 | 0.0256 | 0.0311 |
| 1 | -0.2868 | 0.2437 | -0.1197 | 0.0333 | 0.0319 | 1 | -0.1722 | 0.2431 | -0.0988 | 0.0198 | 0.0385 |
| 2 | -0.3028 | 0.2356 | -0.0623 | 0.0355 | 0.0304 | 2 | -0.1601 | 0.2408 | -0.0921 | 0.0170 | 0.0316 |
| 3 | -0.2550 | 0.2340 | -0.0664 | 0.0300 | 0.0304 | 3 | -0.1524 | 0.2369 | -0.0900 | 0.0167 | 0.0310 |
| 5 | -0.2072 | 0.2299 | -0.0671 | 0.0220 | 0.0294 | 5 | -0.0610 | 0.2392 | -0.1047 | 0.0000 | 0.0313 |
| 7 | -0.1195 | 0.2219 | -0.0774 | 0.0116 | 0.0286 | 7 | 0.0381 | 0.2408 | -0.1114 | -0.0077 | 0.0317 |
| 10 | 0.0797 | 0.2178 | -0.0893 | -0.0145 | 0.0285 | 10 | 0.1982 | 0.2292 | -0.1121 | -0.0275 | 0.0304 |
| 20 | 0.6853 | 0.3493 | -0.1543 | -0.0888 | 0.0469 | 20 | 0.7469 | 0.3704 | -0.1680 | -0.0949 | 0.0496 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.3963 | 0.2547 | -0.0854 | 0.0460 | 0.0333 | -3 | -0.3649 | 0.2438 | -0.0857 | 0.0426 | 0.0312 |
| -2 | -0.3430 | 0.2469 | -0.0954 | 0.0399 | 0.0321 | -2 | -0.3094 | 0.2350 | -0.0957 | 0.0364 | 0.0299 |
| -1 | -0.2896 | 0.2415 | -0.0949 | 0.0318 | 0.0313 | -1 | -0.2481 | 0.2291 | -0.0983 | 0.0293 | 0.0291 |
| 0 | -0.2134 | 0.2400 | -0.0967 | 0.0256 | 0.0311 | 0 | -0.1970 | 0.2291 | -0.0956 | 0.0231 | 0.0290 |
| 1 | -0.1722 | 0.2431 | -0.0988 | 0.0198 | 0.0385 | 1 | -0.1606 | 0.2328 | -0.0968 | 0.0183 | 0.0293 |
| 2 | -0.1601 | 0.2408 | -0.0921 | 0.0170 | 0.0316 | 2 | -0.1168 | 0.2350 | -0.1007 | 0.0124 | 0.0295 |
| 3 | -0.1524 | 0.2369 | -0.0900 | 0.0167 | 0.0310 | 3 | -0.1460 | 0.2365 | -0.0850 | 0.0068 | 0.0299 |
| 5 | -0.0610 | 0.2392 | -0.1047 | 0.0000 | 0.0313 | 5 | 0.0219 | 0.2387 | -0.1189 | -0.0050 | 0.0299 |
| 7 | 0.0381 | 0.2408 | -0.1114 | -0.0077 | 0.0317 | 7 | 0.1124 | 0.2438 | -0.1276 | -0.0160 | 0.0309 |
| 10 | 0.1982 | 0.2292 | -0.1121 | -0.0275 | 0.0304 | 10 | 0.3050 | 0.2490 | -0.1369 | -0.0399 | 0.0320 |
| 20 | 0.7469 | 0.3704 | -0.1680 | -0.0949 | 0.0496 | 20 | 0.7736 | 0.3621 | -0.1780 | -0.0967 | 0.0486 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.3649 | 0.2438 | -0.0857 | 0.0426 | 0.0312 | -3 | -0.3304 | 0.2350 | -0.0957 | 0.0364 | 0.0299 |
| -2 | -0.3094 | 0.2350 | -0.0957 | 0.0364 | 0.0299 | -2 | -0.2481 | 0.2291 | -0.0983 | 0.0293 | 0.0291 |
| -1 | -0.2481 | 0.2291 | -0.0983 | 0.0293 | 0.0291 | -1 | -0.1970 | 0.2291 | -0.0956 | 0.0231 | 0.0290 |
| 0 | -0.1970 | 0.2291 | -0.0956 | 0.0231 | 0.0290 | 0 | -0.1606 | 0.2328 | -0.0968 | 0.0183 | 0.0293 |
| 1 | -0.1606 | 0.2328 | -0.0968 | 0.0183 | 0.0293 | 1 | -0.1168 | 0.2350 | -0.1007 | 0.0124 | 0.0295 |
| 2 | -0.1168 | 0.2350 | -0.1007 | 0.0124 | 0.0295 | 2 | -0.1460 | 0.2365 | -0.0850 | 0.0068 | 0.0299 |
| 3 | -0.1460 | 0.2365 | -0.0850 | 0.0068 | 0.0299 | 3 | 0.0219 | 0.2387 | -0.1189 | -0.0050 | 0.0299 |
| 5 | 0.0219 | 0.2387 | -0.1189 | -0.0050 | 0.0299 | 5 | 0.1124 | 0.2438 | -0.1276 | -0.0160 | 0.0309 |
| 7 | 0.1124 | 0.2438 | -0.1276 | -0.0160 | 0.0309 | 7 | 0.3050 | 0.2490 | -0.1369 | -0.0399 | 0.0320 |
| 10 | 0.3050 | 0.2490 | -0.1369 | -0.0399 | 0.0320 | 10 | 0.7736 | 0.3621 | -0.1780 | -0.0967 | 0.0486 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.3503 | 0.2341 | -0.0811 | 0.0412 | 0.0293 | -3 | -0.3205 | 0.2256 | -0.0919 | 0.0349 | 0.0281 |
| -2 | -0.2985 | 0.2256 | -0.0919 | 0.0349 | 0.0281 | -2 | -0.2480 | 0.2199 | -0.0957 | 0.0290 | 0.0274 |
| -1 | -0.2480 | 0.2199 | -0.0957 | 0.0290 | 0.0274 | -1 | -0.1892 | 0.2199 | -0.0918 | 0.0222 | 0.0266 |
| 0 | -0.1892 | 0.2199 | -0.0918 | 0.0222 | 0.0266 | 0 | -0.1541 | 0.2235 | -0.0946 | 0.0173 | 0.0268 |
| 1 | -0.1541 | 0.2235 | -0.0946 | 0.0173 | 0.0268 | 1 | -0.1121 | 0.2270 | -0.0967 | 0.0116 | 0.0270 |
| 2 | -0.1121 | 0.2270 | -0.0967 | 0.0116 | 0.0270 | 2 | -0.0631 | 0.2270 | -0.1012 | 0.0060 | 0.0273 |
| 3 | -0.0631 | 0.2270 | -0.1012 | 0.0060 | 0.0273 | 3 | 0.0140 | 0.2306 | -0.1124 | -0.0045 | 0.0277 |
| 5 | 0.0140 | 0.2306 | -0.1124 | -0.0045 | 0.0277 | 5 | 0.1093 | 0.2355 | -0.1217 | -0.0159 | 0.0286 |
| 7 | 0.1093 | 0.2355 | -0.1217 | -0.0159 | 0.0286 | 7 | 0.3050 | 0.2412 | -0.1316 | -0.0375 | 0.0297 |
| 10 | 0.3050 | 0.2412 | -0.1316 | -0.0375 | 0.0297 | 10 | 0.7707 | 0.3015 | -0.1728 | -0.0815 | 0.0427 |

CONFIDENTIAL

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-3 WING - Continued

(c) $x_s/c = 0.50$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|-------|---------|---------|-------|-------------------|---------|-------|---------|---------|-------|
| M = 0.60 | | | | | | M = 0.95 | | | | | |
| -3 | -0.6411 | .2034 | -0.0188 | .0786 | .0268 | -3 | -0.6517 | .2777 | -0.0337 | .0791 | .0330 |
| -2 | -0.6081 | .2034 | -0.0018 | .0747 | .0263 | -2 | -0.5359 | .2633 | -0.0514 | .0701 | .0318 |
| -1 | -0.5723 | .1950 | .0085 | .0697 | .0255 | -1 | -0.4963 | .2513 | -0.0345 | .0604 | .0307 |
| 0 | -0.5531 | .1950 | .0152 | .0667 | .0250 | 0 | -0.4804 | .2472 | -0.0205 | .0572 | .0303 |
| 1 | -0.5255 | .1950 | .0197 | .0630 | .0247 | 1 | -0.3932 | .2432 | -0.0172 | .0482 | .0295 |
| 2 | -0.4898 | .1895 | .0268 | .0591 | .0239 | 2 | -0.3615 | .2352 | -0.0058 | .0437 | .0288 |
| 3 | -0.4623 | .1867 | .0337 | .0547 | .0234 | 3 | -0.3139 | .2312 | -0.0022 | .0389 | .0280 |
| 5 | -0.3880 | .1755 | .0382 | .0441 | .0224 | 5 | -0.2426 | .2135 | .0167 | .0299 | .0256 |
| 7 | -0.2807 | .1727 | .0359 | .0307 | .0213 | 7 | -0.1157 | .2031 | .0269 | .0148 | .0241 |
| 10 | -0.0468 | .1644 | .0329 | .0017 | .0208 | 10 | .1221 | .1975 | .0247 | -0.0141 | .0246 |
| 20 | .4045 | .2870 | -0.0302 | -0.0569 | .0364 | 20 | .3235 | .2312 | .0013 | -0.0415 | .0300 |
| M = 0.80 | | | | | | M = 1.00 | | | | | |
| -3 | -0.6428 | .2258 | -0.0200 | .0783 | .0285 | -3 | -0.5426 | .2732 | -0.0724 | .0630 | .0335 |
| -2 | -0.6016 | .2201 | -0.0082 | .0733 | .0275 | -2 | -0.4820 | .2609 | -0.0723 | .0562 | .0317 |
| -1 | -0.5585 | .2144 | .0058 | .0684 | .0266 | -1 | -0.4138 | .2501 | -0.0689 | .0492 | .0307 |
| 0 | -0.5360 | .2106 | .0087 | .0657 | .0262 | 0 | -0.3456 | .2478 | -0.0709 | .0402 | .0302 |
| 1 | -0.4892 | .2069 | .0208 | .0600 | .0257 | 1 | -0.2774 | .2471 | -0.0607 | .0320 | .0302 |
| 2 | -0.4610 | .2021 | .0311 | .0562 | .0248 | 2 | -0.2319 | .2478 | -0.0520 | .0264 | .0299 |
| 3 | -0.4367 | .1974 | .0398 | .0528 | .0243 | 3 | -0.1985 | .2440 | -0.0443 | .0215 | .0295 |
| 5 | -0.3711 | .1879 | .0511 | .0448 | .0230 | 5 | -0.1334 | .2287 | -0.0231 | .0154 | .0279 |
| 7 | -0.2661 | .1736 | .0581 | .0308 | .0216 | 7 | -0.0637 | .2287 | -0.0330 | -0.0046 | .0274 |
| 10 | -0.0206 | .1689 | .0523 | .0000 | .0211 | 10 | .2228 | .2248 | -0.0206 | -0.0270 | .0285 |
| 20 | .4348 | .2875 | -0.0271 | -0.0585 | .0372 | 20 | .5865 | .3284 | -0.0659 | -0.0737 | .0433 |
| M = 0.85 | | | | | | M = 1.05 | | | | | |
| -3 | -0.6794 | .2420 | -0.0162 | .0827 | .0303 | -3 | -0.5230 | .2662 | -0.0687 | .0604 | .0323 |
| -2 | -0.6163 | .2269 | -0.0086 | .0749 | .0286 | -2 | -0.4692 | .2545 | -0.0691 | .0539 | .0308 |
| -1 | -0.5621 | .2198 | .0044 | .0685 | .0273 | -1 | -0.3966 | .3148 | -0.0738 | .0456 | .0294 |
| 0 | -0.5358 | .2181 | .0091 | .0660 | .0271 | 0 | -0.3210 | .2398 | -0.0668 | .0368 | .0290 |
| 1 | -0.4868 | .2110 | .0268 | .0600 | .0260 | 1 | -0.2702 | .2412 | .0038 | .0309 | .0288 |
| 2 | -0.4605 | .2092 | .0349 | .0564 | .0257 | 2 | -0.2194 | .2383 | .0003 | .0250 | .0287 |
| 3 | -0.4395 | .2065 | .0453 | .0536 | .0252 | 3 | -0.1758 | .2346 | -0.0047 | .0197 | .0283 |
| 5 | -0.3730 | .1941 | .0593 | .0451 | .0235 | 5 | -0.0697 | .2287 | -0.0160 | .0074 | .0275 |
| 7 | -0.2592 | .1800 | .0657 | .0305 | .0222 | 7 | .0755 | .2214 | -0.0303 | -0.0097 | .0268 |
| 10 | -0.0017 | .1711 | .0567 | -0.0007 | .0215 | 10 | .2978 | .2302 | -0.0577 | -0.0362 | .0290 |
| 20 | .4640 | .2934 | -0.0313 | -0.0607 | .0381 | 20 | .5695 | .2633 | -0.1075 | -0.0515 | .0328 |
| M = 0.90 | | | | | | M = 1.10 | | | | | |
| -3 | -0.7064 | .2569 | -0.0145 | .0847 | .0321 | -3 | -0.5022 | .2529 | .0331 | .0591 | .0311 |
| -2 | -0.6517 | .2502 | -0.0043 | .0790 | .0310 | -2 | -0.4506 | .2408 | .0234 | .0526 | .0295 |
| -1 | -0.5953 | .2443 | .0084 | .0726 | .0301 | -1 | -0.3809 | .2303 | .0115 | .0450 | .0282 |
| 0 | -0.5688 | .2401 | .0133 | .0692 | .0298 | 0 | -0.3111 | .2281 | .0052 | .0373 | .0276 |
| 1 | -0.5024 | .2334 | .0272 | .0612 | .0287 | 1 | -0.3433 | .1575 | .0728 | .0305 | .0274 |
| 2 | -0.4776 | .2275 | .0361 | .0585 | .0276 | 2 | -0.2065 | .2281 | -0.0015 | .0246 | .0272 |
| 3 | -0.4361 | .2208 | .0420 | .0531 | .0267 | 3 | -0.1576 | .2246 | -0.0069 | .0187 | .0269 |
| 5 | -0.3449 | .2040 | .0495 | .0424 | .0248 | 5 | -0.0600 | .2175 | -0.0167 | .0068 | .0259 |
| 7 | -0.2122 | .1872 | .0540 | .0259 | .0229 | 7 | .0795 | .2126 | -0.0297 | -0.0105 | .0253 |
| 10 | .0365 | .1813 | .0513 | -0.0044 | .0224 | 10 | .2860 | .2232 | -0.0555 | -0.0348 | .0276 |
| 20 | .2603 | .2208 | .0164 | -0.0366 | .0287 | | | | | | |

TABLE III.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-3 WING - Continued

(d) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|--------|---------|--------|-------------------|---------|--------|--------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| $M = 0.80$ | | | | | | | | | | | |
| -2 | -0.6333 | 0.1924 | 0.0629 | 0.0781 | 0.0238 | -3 | -0.7748 | 0.3038 | 0.0637 | 0.0917 | 0.0336 |
| -1 | -0.5865 | 0.1868 | 0.0688 | 0.0726 | 0.0230 | -2 | -0.6716 | 0.2476 | 0.0536 | 0.0795 | 0.0317 |
| 0 | -0.5397 | 0.1840 | 0.0764 | 0.0675 | 0.0223 | -1 | -0.5843 | 0.2395 | 0.0569 | 0.0702 | 0.0303 |
| 1 | -0.5094 | 0.1826 | 0.0826 | 0.0636 | 0.0220 | 0 | -0.5049 | 0.2315 | 0.0694 | 0.0628 | 0.0293 |
| 2 | -0.4708 | 0.1812 | 0.0890 | 0.0586 | 0.0213 | 1 | -0.4462 | 0.2275 | 0.0670 | 0.0531 | 0.0293 |
| 3 | -0.4295 | 0.1756 | 0.0949 | 0.0536 | 0.0210 | 2 | -0.4017 | 0.2154 | 0.0927 | 0.0486 | 0.0272 |
| 5 | -0.3194 | 0.1645 | 0.1059 | 0.0402 | 0.0193 | 3 | -0.3223 | 0.2074 | 0.0942 | 0.0412 | 0.0260 |
| 7 | -0.1955 | 0.1575 | 0.1184 | 0.0251 | 0.0181 | 5 | -0.1858 | 0.1993 | 0.1095 | 0.0248 | 0.0251 |
| 10 | 0.0220 | 0.1715 | 0.1143 | -0.0006 | 0.0199 | 7 | 0.0032 | 0.1953 | 0.1051 | 0.0032 | 0.0245 |
| 20 | 0.3497 | 0.2941 | 0.0560 | -0.0474 | 0.0346 | 10 | 0.2096 | 0.2114 | 0.0933 | -0.0232 | 0.0269 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.7092 | 0.2166 | 0.0429 | 0.0852 | 0.0268 | -3 | -0.6968 | 0.2644 | 0.0327 | 0.0828 | 0.0336 |
| -2 | -0.6341 | 0.2071 | 0.0511 | 0.0768 | 0.0255 | -2 | -0.6194 | 0.2483 | 0.0283 | 0.0732 | 0.0319 |
| -1 | -0.5741 | 0.1976 | 0.0620 | 0.0704 | 0.0243 | -1 | -0.5435 | 0.2390 | 0.0299 | 0.0646 | 0.0303 |
| 0 | -0.5215 | 0.1957 | 0.0748 | 0.0639 | 0.0231 | 0 | -0.4448 | 0.2329 | 0.0335 | 0.0529 | 0.0294 |
| 1 | -0.4690 | 0.1900 | 0.0781 | 0.0586 | 0.0231 | 1 | -0.3811 | 0.2290 | 0.0421 | 0.0462 | 0.0286 |
| 2 | -0.4259 | 0.1843 | 0.0870 | 0.0536 | 0.0223 | 2 | -0.3158 | 0.2221 | 0.0498 | 0.0391 | 0.0278 |
| 3 | -0.3658 | 0.1805 | 0.0952 | 0.0468 | 0.0216 | 3 | -0.2399 | 0.2137 | 0.0529 | 0.0302 | 0.0267 |
| 5 | -0.2345 | 0.1691 | 0.1056 | 0.0308 | 0.0202 | 5 | -0.0956 | 0.2068 | 0.0664 | 0.0138 | 0.0260 |
| 7 | -0.0901 | 0.1653 | 0.1103 | 0.0137 | 0.0197 | 7 | 0.1017 | 0.2091 | 0.0644 | -0.0098 | 0.0261 |
| 10 | 0.1351 | 0.1833 | 0.0962 | -0.0141 | 0.0223 | 10 | 0.3294 | 0.2367 | 0.0576 | -0.0382 | 0.0306 |
| 20 | 0.3752 | 0.2925 | 0.0716 | -0.0494 | 0.0355 | 20 | 0.5496 | 0.3443 | 0.0330 | -0.0692 | 0.0436 |
| $M = 0.90$ | | | | | | | | | | | |
| $M = 0.95$ | | | | | | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| $M = 1.05$ | | | | | | | | | | | |
| $M = 1.10$ | | | | | | | | | | | |

CONFIDENTIAL

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-3 WING - Concluded

(e) $x_s/c = 0.90$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.7197 | 0.2017 | 0.1224 | 0.0852 | 0.0273 | -3 | -0.8079 | 0.2502 | 0.1563 | 0.0922 | 0.0323 |
| -2 | -0.6538 | 0.1877 | 0.1227 | 0.0774 | 0.0257 | -2 | -0.6970 | 0.2422 | 0.1474 | 0.0796 | 0.0316 |
| -1 | -0.5824 | 0.1822 | 0.1303 | 0.0702 | 0.0247 | -1 | -0.5940 | 0.2342 | 0.1437 | 0.0690 | 0.0307 |
| 0 | -0.5274 | 0.1752 | 0.1288 | 0.0635 | 0.0239 | 0 | -0.5148 | 0.2382 | 0.1509 | 0.0607 | 0.0292 |
| 1 | -0.4835 | 0.1738 | 0.1270 | 0.0579 | 0.0236 | 1 | -0.4812 | 0.2181 | 0.2589 | 0.0514 | 0.0280 |
| 2 | -0.4258 | 0.1724 | 0.1364 | 0.0518 | 0.0226 | 2 | -0.6811 | 0.2101 | 0.2357 | 0.0408 | 0.0274 |
| 3 | -0.3708 | 0.1655 | 0.1388 | 0.0451 | 0.0216 | 3 | -0.4974 | 0.2021 | 0.2213 | 0.0305 | 0.0258 |
| 5 | -0.2253 | 0.1558 | 0.1372 | 0.0278 | 0.0200 | 5 | -0.1489 | 0.1860 | 0.1712 | 0.0112 | 0.0238 |
| 7 | -0.0632 | 0.1558 | 0.1339 | 0.0100 | 0.0195 | 7 | 0.2851 | 0.2021 | 0.0937 | -0.0144 | 0.0255 |
| 10 | 0.2060 | 0.1864 | 0.1018 | -0.0234 | 0.0229 | 10 | 0.8332 | 0.2422 | -0.0131 | -0.0504 | 0.0314 |
| 20 | 0.6455 | 0.3644 | -0.0176 | -0.0863 | 0.0473 | 20 | 0.7920 | 0.4138 | -0.0399 | -0.1044 | 0.0535 |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.7204 | 0.2056 | 0.1172 | 0.0846 | 0.0271 | -3 | -0.8033 | 0.2701 | 0.1764 | 0.0922 | 0.0350 |
| -2 | -0.6418 | 0.1942 | 0.1234 | 0.0759 | 0.0256 | -2 | -0.7048 | 0.2524 | 0.1592 | 0.0814 | 0.0330 |
| -1 | -0.5725 | 0.1847 | 0.1313 | 0.0679 | 0.0248 | -1 | -0.5911 | 0.2394 | 0.1509 | 0.0682 | 0.0311 |
| 0 | -0.5052 | 0.1790 | 0.1336 | 0.0603 | 0.0242 | 0 | -0.5001 | 0.2294 | 0.1504 | 0.0587 | 0.0298 |
| 1 | -0.4472 | 0.1762 | 0.1345 | 0.0539 | 0.0233 | 1 | -0.4244 | 0.2225 | 0.1539 | 0.0498 | 0.0285 |
| 2 | -0.3779 | 0.1696 | 0.1374 | 0.0463 | 0.0226 | 2 | -0.3183 | 0.2102 | 0.1519 | 0.0384 | 0.0268 |
| 3 | -0.2975 | 0.1610 | 0.1392 | 0.0368 | 0.0214 | 3 | -0.2425 | 0.2087 | 0.1583 | 0.0298 | 0.0264 |
| 5 | -0.1366 | 0.1535 | 0.1427 | 0.0186 | 0.0203 | 5 | -0.0682 | 0.2064 | 0.1524 | 0.0101 | 0.0261 |
| 7 | 0.0374 | 0.1563 | 0.1377 | -0.0011 | 0.0203 | 7 | 0.1516 | 0.2179 | 0.1245 | -0.0169 | 0.0275 |
| 10 | 0.3218 | 0.1932 | 0.0846 | -0.0372 | 0.0253 | 10 | 0.4168 | 0.2624 | 0.0874 | -0.0501 | 0.0341 |
| 20 | 0.7147 | 0.3713 | -0.0264 | -0.0941 | 0.0488 | 20 | 0.8184 | 0.4328 | -0.0343 | -0.1075 | 0.0557 |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.7344 | 0.2142 | 0.1181 | 0.0858 | 0.0281 | -3 | -0.7892 | 0.2637 | 0.1782 | 0.0897 | 0.0340 |
| -2 | -0.6470 | 0.1983 | 0.1204 | 0.0751 | 0.0265 | -2 | -0.6891 | 0.2438 | 0.1650 | 0.0788 | 0.0317 |
| -1 | -0.5701 | 0.1912 | 0.1296 | 0.0670 | 0.0255 | -1 | -0.6021 | 0.2306 | 0.1698 | 0.0697 | 0.0299 |
| 0 | -0.4931 | 0.0947 | 0.1336 | 0.0585 | 0.0243 | 0 | -0.4860 | 0.2203 | 0.1479 | 0.0559 | 0.0287 |
| 1 | -0.4337 | 0.1806 | 0.1360 | 0.0514 | 0.0238 | 1 | -0.7834 | 0.2093 | 0.2456 | 0.0456 | 0.0267 |
| 2 | -0.3602 | 0.1744 | 0.1384 | 0.0432 | 0.0230 | 2 | -0.6296 | 0.2034 | 0.2273 | 0.0368 | 0.0256 |
| 3 | -0.2710 | 0.1638 | 0.1365 | 0.0333 | 0.0217 | 3 | -0.4497 | 0.1998 | 0.2071 | 0.0273 | 0.0252 |
| 5 | -0.1154 | 0.1594 | 0.1450 | 0.0160 | 0.0210 | 5 | -0.0435 | 0.1990 | 0.1412 | 0.0044 | 0.0248 |
| 7 | 0.0595 | 0.1673 | 0.1405 | -0.0046 | 0.0215 | 7 | 0.3627 | 0.2130 | 0.0638 | -0.0059 | 0.0269 |
| 10 | 0.3427 | 0.2045 | 0.0926 | -0.0404 | 0.0268 | 10 | 0.8066 | 0.2534 | -0.0189 | -0.0494 | 0.0329 |
| 20 | 0.7257 | 0.3754 | -0.0280 | -0.0954 | 0.0491 | 20 | 0.7979 | 0.4363 | -0.0056 | -0.1044 | 0.0545 |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.7700 | 0.2238 | 0.1233 | 0.0883 | 0.0301 | -3 | -0.7521 | 0.2517 | 0.1736 | 0.0861 | 0.0323 |
| -2 | -0.6657 | 0.2113 | 0.1241 | 0.0940 | 0.0279 | -2 | -0.6685 | 0.2320 | 0.1690 | 0.0771 | 0.0300 |
| -1 | -0.5796 | 0.2029 | 0.1273 | 0.0671 | 0.0268 | -1 | -0.5850 | 0.2193 | 0.1608 | 0.0678 | 0.0283 |
| 0 | -0.5051 | 0.1945 | 0.1342 | 0.0587 | 0.0258 | 0 | -0.4944 | 0.2066 | 0.1555 | 0.0573 | 0.0269 |
| 1 | -0.4388 | 0.1920 | 0.1413 | 0.0514 | 0.0172 | 1 | -0.3816 | 0.1967 | 0.1451 | 0.0452 | 0.0251 |
| 2 | -0.3643 | 0.1861 | 0.1450 | 0.0430 | 0.0244 | 2 | -0.2786 | 0.1918 | 0.1446 | 0.0333 | 0.0244 |
| 3 | -0.2683 | 0.1735 | 0.1434 | 0.0319 | 0.0225 | 3 | -0.1922 | 0.1897 | 0.1456 | 0.0240 | 0.0238 |
| 5 | -0.0994 | 0.1710 | 0.1494 | 0.0141 | 0.0219 | 5 | 0.0139 | 0.1911 | 0.1228 | -0.0006 | 0.0236 |
| 7 | 0.0911 | 0.1769 | 0.1350 | -0.0084 | 0.0227 | 7 | 0.1950 | 0.2066 | 0.0992 | -0.0223 | 0.0259 |
| 10 | 0.3643 | 0.2113 | 0.0864 | -0.0440 | 0.0279 | 10 | 0.3900 | 0.2461 | 0.0744 | -0.0474 | 0.0313 |
| 20 | 0.7535 | 0.3873 | -0.0332 | -0.0997 | 0.0509 | | | | | | |

CONTINUITY

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING

(a) Plain Wing

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|-------|--------|--------|-------|-------------------|--------|-------|--------|--------|-------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.2449 | .0103 | -.0101 | .0285 | .0016 | -3 | -.3383 | .0343 | .0196 | .0397 | .0034 |
| -2 | -0.1612 | .0083 | -.0053 | .0189 | .0012 | -2 | -.2275 | .0236 | .0130 | .0261 | .0024 |
| -1 | -0.0877 | .0052 | -.0009 | .0105 | .0009 | -1 | -.1225 | .0148 | .0062 | .0140 | .0015 |
| 0 | -0.0204 | .0052 | -.0006 | .0022 | .0007 | 0 | -.0198 | .0118 | .0034 | .0020 | .0015 |
| 1 | .0510 | .0072 | -.0013 | -.0062 | .0009 | 1 | .1108 | .0159 | -.0033 | -.0135 | .0022 |
| 2 | .1347 | .0124 | .0050 | -.0158 | .0014 | 2 | .2275 | .0195 | -.0064 | -.0271 | .0030 |
| 3 | .2265 | .0186 | .0146 | -.0261 | .0022 | 3 | .3266 | .0283 | -.0144 | -.0387 | .0045 |
| 5 | .3612 | .0331 | .0206 | -.0422 | .0045 | 5 | .4935 | .0532 | -.0442 | -.0589 | .0086 |
| 7 | .5142 | .0630 | .0200 | -.0620 | .0090 | 7 | .6766 | .0915 | -.0761 | -.0800 | .0144 |
| 10 | .6754 | .1250 | -.0290 | -.0850 | .0178 | | | | | | |
| 20 | .7571 | .3099 | -.0874 | -.1011 | .0421 | | | | | | |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -.2978 | .0189 | -.0165 | .0347 | .0021 | -3 | -.3233 | .0395 | .0298 | .0383 | .0040 |
| -2 | -.1967 | .0112 | -.0101 | .0227 | .0014 | -2 | -.2140 | .0282 | .0178 | .0253 | .0028 |
| -1 | -.1108 | .0070 | -.0052 | .0124 | .0010 | -1 | -.1059 | .0214 | .0079 | .0122 | .0022 |
| 0 | -.0139 | .0049 | -.0004 | .0015 | .0009 | 0 | -.0056 | .0186 | .0030 | .0007 | .0021 |
| 1 | .0803 | .0070 | .0070 | -.0095 | .0011 | 1 | .1059 | .0203 | -.0032 | -.0120 | .0026 |
| 2 | .1759 | .0119 | .0122 | -.0204 | .0018 | 2 | .2062 | .0265 | -.0127 | -.0247 | .0036 |
| 3 | .2811 | .0175 | .0187 | -.0328 | .0028 | 3 | .3066 | .0339 | -.0223 | -.0366 | .0052 |
| 5 | .4736 | .0386 | .0266 | -.0550 | .0064 | 5 | .4571 | .0553 | -.0402 | -.0539 | .0085 |
| 7 | .6371 | .0736 | .0190 | -.0750 | .0113 | 7 | .6020 | .0852 | -.0653 | -.0708 | .0134 |
| 10 | .8254 | .1388 | -.0054 | -.1006 | .0209 | | | | | | |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -.3382 | .0230 | -.1118 | .0388 | .0024 | -3 | -.2945 | .0380 | .1276 | .0345 | .0039 |
| -2 | -.2081 | .0132 | -.1789 | .0241 | .0015 | -2 | -.2035 | .0282 | .1195 | .0234 | .0027 |
| -1 | -.1171 | .0079 | -.1471 | .0132 | .0009 | -1 | -.1071 | .0217 | .1095 | .0117 | .0022 |
| 0 | -.0195 | .0066 | -.1133 | .0024 | .0010 | 0 | -.0054 | .0190 | .1029 | .0008 | .0020 |
| 1 | .0950 | .0072 | .1454 | -.0109 | .0012 | 1 | .1178 | .0222 | -.1070 | -.0132 | .0026 |
| 2 | .1912 | .0119 | .1845 | -.0221 | .0019 | 2 | .2035 | .0271 | -.1151 | -.0238 | .0036 |
| 3 | .3122 | .0191 | .1184 | -.0360 | .0033 | 3 | .2892 | .0342 | -.1232 | -.0340 | .0050 |
| 5 | .5203 | .0441 | .1459 | -.0605 | .0075 | 5 | .4391 | .0542 | -.1396 | -.0515 | .0082 |
| 7 | .6842 | .0790 | .1625 | -.0807 | .0129 | 7 | .5784 | .0868 | -.1607 | -.0686 | .0131 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -.3567 | .0249 | -.1052 | .0410 | .0027 | -3 | -.2801 | .0368 | .1283 | .0330 | .0037 |
| -2 | -.2398 | .0143 | -.1140 | .0269 | .0017 | -2 | -.1919 | .0268 | .1191 | .0221 | .0027 |
| -1 | -.1230 | .0087 | -.1082 | .0138 | .0010 | -1 | -.0830 | .0210 | .1077 | .0098 | .0021 |
| 0 | -.0148 | .0062 | -.1003 | -.0007 | .0010 | 0 | -.0052 | .0189 | .1031 | -.0006 | .0020 |
| 1 | .0984 | .0081 | .1098 | -.0120 | .0013 | 1 | .0934 | .0210 | -.1040 | -.0032 | .0024 |
| 2 | .2214 | .0125 | .1168 | -.0254 | .0023 | 2 | .2075 | .0273 | -.1172 | -.0240 | .0035 |
| 3 | .3444 | .0230 | .1066 | -.0404 | .0040 | 3 | .2853 | .0341 | -.1237 | -.0333 | .0049 |
| 5 | .5400 | .0498 | -.1307 | -.0643 | .0084 | 5 | .4202 | .0525 | -.1375 | -.0491 | .0079 |
| 7 | .7110 | .0903 | -.1622 | -.0856 | .0147 | 7 | .5540 | .0819 | -.1588 | -.0648 | .0086 |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -.3383 | .0343 | .0196 | .0397 | .0034 | -3 | -.2945 | .0380 | .1276 | .0345 | .0039 |
| -2 | -.2275 | .0236 | .0130 | .0261 | .0024 | -2 | -.2035 | .0282 | .1195 | .0234 | .0027 |
| -1 | -.1225 | .0148 | .0062 | .0140 | .0015 | -1 | -.1071 | .0217 | .1095 | .0117 | .0022 |
| 0 | -.0198 | .0118 | .0034 | .0020 | .0015 | 0 | -.0054 | .0190 | .1029 | .0008 | .0020 |
| 1 | .1108 | .0159 | -.0033 | -.0135 | .0022 | 1 | .1178 | .0222 | -.1070 | -.0132 | .0026 |
| 2 | .2275 | .0195 | -.0064 | -.0271 | .0030 | 2 | .2035 | .0271 | -.1151 | -.0238 | .0036 |
| 3 | .3266 | .0283 | -.0144 | -.0387 | .0045 | 3 | .2892 | .0342 | -.1232 | -.0340 | .0050 |
| 5 | .4935 | .0532 | -.0442 | -.0589 | .0086 | 5 | .4391 | .0542 | -.1396 | -.0515 | .0082 |
| 7 | .6766 | .0915 | -.0761 | -.0800 | .0144 | 7 | .5784 | .0868 | -.1607 | -.0686 | .0131 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -.3233 | .0395 | .0298 | .0383 | .0040 | -3 | -.2945 | .0380 | .1276 | .0345 | .0039 |
| -2 | -.2140 | .0282 | .0178 | .0253 | .0028 | -2 | -.2035 | .0282 | .1195 | .0234 | .0027 |
| -1 | -.1059 | .0214 | .0079 | .0122 | .0022 | -1 | -.1071 | .0217 | .1095 | .0117 | .0022 |
| 0 | -.0056 | .0186 | .0030 | .0007 | .0021 | 0 | -.0054 | .0190 | .1029 | .0008 | .0020 |
| 1 | .1059 | .0203 | -.0032 | -.0120 | .0026 | 1 | .1178 | .0222 | -.1070 | -.0132 | .0026 |
| 2 | .2062 | .0265 | -.0127 | -.0247 | .0036 | 2 | .2035 | .0271 | -.1151 | -.0238 | .0036 |
| 3 | .3066 | .0339 | -.0223 | -.0366 | .0052 | 3 | .2892 | .0342 | -.1232 | -.0340 | .0050 |
| 5 | .4571 | .0553 | -.0402 | -.0539 | .0085 | 5 | .4391 | .0542 | -.1396 | -.0515 | .0082 |
| 7 | .6020 | .0852 | -.0653 | -.0708 | .0134 | 7 | .5784 | .0868 | -.1607 | -.0686 | .0131 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -.2945 | .0380 | .1276 | .0345 | .0039 | -3 | -.2945 | .0380 | .1276 | .0345 | .0039 |
| -2 | -.2035 | .0282 | .1195 | .0234 | .0027 | -2 | -.2035 | .0282 | .1195 | .0234 | .0027 |
| -1 | -.1071 | .0217 | .1095 | .0117 | .0022 | -1 | -.1071 | .0217 | .1095 | .0117 | .0022 |
| 0 | -.0054 | .0190 | .1029 | .0008 | .0020 | 0 | -.0054 | .0190 | .1029 | .0008 | .0020 |
| 1 | .1178 | .0222 | -.1070 | -.0132 | .0026 | 1 | .1178 | .0222 | -.1070 | -.0132 | .0026 |
| 2 | .2035 | .0271 | -.1151 | -.0238 | .0036 | 2 | .2035 | .0271 | -.1151 | -.0238 | .0036 |
| 3 | .2892 | .0342 | -.1232 | -.0340 | .0050 | 3 | .2892 | .0342 | -.1232 | -.0340 | .0050 |
| 5 | .4391 | .0542 | -.1396 | -.0515 | .0082 | 5 | .4391 | .0542 | -.1396 | -.0515 | .0082 |
| 7 | .5784 | .0868 | -.1607 | -.0686 | .0131 | 7 | .5784 | .0868 | -.1607 | -.0686 | .0131 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -.2801 | .0368 | .1283 | .0330 | .0037 | -3 | -.2801 | .0368 | .1283 | .0330 | .0037 |
| -2 | -.1919 | .0268 | .1191 | .0221 | .0027 | -2 | -.1919 | .0268 | .1191 | .0221 | .0027 |
| -1 | -.0830 | .0210 | .1077 | .0098 | .0021 | -1 | -.0830 | .0210 | .1077 | .0098 | .0021 |
| 0 | -.0052 | .0189 | .1031 | -.0006 | .0020 | 0 | -.0052 | .0189 | .1031 | -.0006 | .0020 |
| 1 | .0934 | .0210 | -.1040 | -.0032 | .0024 | 1 | .0934 | .0210 | -.1040 | -.0032 | .0024 |
| 2 | .2075 | .0273 | -.1172 | -.0240 | .0035 | 2 | .2075 | .0273 | -.1172 | -.0240 | .0035 |
| 3 | .2853 | .0341 | -.1237 | -.0333 | .0049 | 3 | .2853 | .0341 | -.1237 | -.0333 | .0049 |
| 5 | .4202 | .0525 | -.1375 | -.0491 | .0079 | 5 | .4202 | .0525 | -.1375 | -.0491 | .0079 |
| 7 | .5540 | .0819 | -.1588 | -.0648 | .0086 | 7 | .5540 | .0819 | -.1588 | -.0648 | .0086 |

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(b) $x_s/c = 0.30$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α_s , deg | c_L | c_D | c_M | c_l | c_n | α_s , deg | c_L | c_D | c_M | c_l | c_n |
|---------------------|---------|--------|---------|---------|--------|---------------------|---------|--------|---------|------------|--------|
| $M = 0.60$ | | | | | | | | | | $M = 0.95$ | |
| -3 | -0.3349 | 0.1459 | -0.0911 | 0.0364 | 0.0200 | -3 | -0.5039 | 0.2211 | -0.0547 | 0.0606 | 0.0282 |
| -2 | -0.3329 | 0.1387 | -0.0973 | 0.0364 | 0.0191 | -2 | -0.4634 | 0.2064 | -0.0619 | 0.0544 | 0.0265 |
| -1 | -0.3410 | 0.1367 | -0.0993 | 0.0376 | 0.0187 | -1 | -0.4112 | 0.1941 | -0.0668 | 0.0483 | 0.0252 |
| 0 | -0.3389 | 0.1346 | -0.0975 | 0.0367 | 0.0189 | 0 | -0.3382 | 0.1888 | -0.0729 | 0.0394 | 0.0247 |
| 1 | -0.3166 | 0.1459 | -0.0929 | 0.0336 | 0.0196 | 1 | -0.3012 | 0.1877 | -0.0668 | 0.0338 | 0.0248 |
| 2 | -0.2862 | 0.1490 | -0.0871 | 0.0290 | 0.0199 | 2 | -0.2548 | 0.1877 | -0.0662 | 0.0287 | 0.0248 |
| 3 | -0.2436 | 0.1531 | -0.0905 | 0.0213 | 0.0201 | 3 | -0.2143 | 0.1877 | -0.0708 | 0.0232 | 0.0249 |
| 5 | -0.1461 | 0.1613 | -0.0897 | 0.0080 | 0.0212 | 5 | -0.1216 | 0.1847 | -0.0845 | 0.0114 | 0.0250 |
| 7 | -0.0507 | 0.1695 | -0.0880 | -0.0049 | 0.0222 | 7 | -0.0174 | 0.1847 | -0.0991 | -0.0026 | 0.0251 |
| 10 | 0.1116 | 0.1850 | -0.0872 | -0.0247 | 0.0243 | 10 | 0.2433 | 0.1935 | -0.1059 | -0.0356 | 0.0263 |
| 20 | 0.5987 | 0.3000 | -0.0772 | -0.0845 | 0.0414 | | | | | | |
| $M = 0.80$ | | | | | | | | | | $M = 1.00$ | |
| -3 | -0.4887 | 0.1721 | -0.0744 | 0.0576 | 0.0234 | -3 | -0.3898 | 0.2186 | -0.0739 | 0.0468 | 0.0280 |
| -2 | -0.5093 | 0.1721 | -0.0738 | 0.0586 | 0.0230 | -2 | -0.3289 | 0.2074 | -0.0851 | 0.0394 | 0.0269 |
| -1 | -0.5093 | 0.1687 | -0.0845 | 0.0584 | 0.0225 | -1 | -0.2768 | 0.1979 | -0.0916 | 0.0330 | 0.0258 |
| 0 | -0.4611 | 0.1624 | -0.0857 | 0.0521 | 0.0221 | 0 | -0.2104 | 0.1934 | -0.0979 | 0.0253 | 0.0254 |
| 1 | -0.4254 | 0.1603 | -0.0854 | 0.0469 | 0.0220 | 1 | -0.1439 | 0.1940 | -0.0955 | 0.0168 | 0.0256 |
| 2 | -0.3992 | 0.1582 | -0.0734 | 0.0431 | 0.0218 | 2 | -0.0997 | 0.1962 | -0.0963 | 0.0116 | 0.0259 |
| 3 | -0.3510 | 0.1589 | -0.0677 | 0.0368 | 0.0219 | 3 | -0.0443 | 0.1990 | -0.1011 | 0.0039 | 0.0264 |
| 5 | -0.2409 | 0.1603 | -0.0733 | 0.0224 | 0.0221 | 5 | 0.0609 | 0.2057 | -0.1176 | -0.0093 | 0.0272 |
| 7 | -0.0964 | 0.1638 | -0.0847 | 0.0046 | 0.0228 | 7 | 0.1384 | 0.2102 | -0.1287 | -0.0195 | 0.0281 |
| 10 | 0.1583 | 0.1763 | -0.0864 | -0.0272 | 0.0244 | 10 | 0.4152 | 0.2298 | -0.1450 | -0.0539 | 0.0309 |
| 20 | 0.6539 | 0.3066 | -0.0897 | -0.0883 | 0.0429 | | | | | | |
| $M = 0.85$ | | | | | | | | | | $M = 1.05$ | |
| -3 | -0.6049 | 0.2041 | -0.0784 | 0.0717 | 0.0267 | -3 | -0.3620 | 0.2118 | -0.0735 | 0.0432 | 0.0267 |
| -2 | -0.5816 | 0.1943 | -0.0779 | 0.0680 | 0.0253 | -2 | -0.3087 | 0.2005 | -0.0838 | 0.0364 | 0.0255 |
| -1 | -0.5493 | 0.1832 | -0.0759 | 0.0627 | 0.0242 | -1 | -0.2576 | 0.1940 | -0.0902 | 0.0306 | 0.0248 |
| 0 | -0.5066 | 0.1754 | -0.0671 | 0.0570 | 0.0231 | 0 | -0.1991 | 0.1913 | -0.0967 | 0.0233 | 0.0245 |
| 1 | -0.4549 | 0.1708 | -0.0699 | 0.0503 | 0.0229 | 1 | -0.1384 | 0.1913 | -0.0942 | 0.0155 | 0.0244 |
| 2 | -0.4136 | 0.1701 | -0.0667 | 0.0444 | 0.0230 | 2 | -0.0798 | 0.1940 | -0.0944 | 0.0087 | 0.0245 |
| 3 | -0.3490 | 0.1688 | -0.0691 | 0.0362 | 0.0228 | 3 | -0.0298 | 0.1967 | -0.0994 | 0.0024 | 0.0248 |
| 5 | -0.2391 | 0.1668 | -0.0757 | 0.0226 | 0.0229 | 5 | 0.0639 | 0.2032 | -0.1144 | -0.0091 | 0.0257 |
| 7 | -0.1060 | 0.1695 | -0.0823 | 0.0063 | 0.0234 | 7 | 0.1597 | 0.2129 | -0.1295 | -0.0217 | 0.0272 |
| 10 | 0.1809 | 0.1799 | -0.0906 | -0.0297 | 0.0249 | 10 | 0.3832 | 0.2269 | -0.1429 | -0.0497 | 0.0297 |
| 20 | 0.6721 | 0.3075 | -0.0938 | -0.0900 | 0.0430 | | | | | | |
| $M = 0.90$ | | | | | | | | | | $M = 1.10$ | |
| -3 | -0.6074 | 0.2190 | -0.0506 | 0.0719 | 0.0280 | -3 | -0.3506 | 0.2073 | -0.0719 | 0.0414 | 0.0257 |
| -2 | -0.5683 | 0.2048 | -0.0545 | 0.0665 | 0.0264 | -2 | -0.3063 | 0.1984 | -0.0793 | 0.0362 | 0.0246 |
| -1 | -0.5194 | 0.1918 | -0.0560 | 0.0595 | 0.0249 | -1 | -0.2475 | 0.1905 | -0.0873 | 0.0292 | 0.0238 |
| 0 | -0.4522 | 0.1844 | -0.0565 | 0.0517 | 0.0242 | 0 | -0.1856 | 0.1864 | -0.0938 | 0.0218 | 0.0233 |
| 1 | -0.4094 | 0.1844 | -0.0510 | 0.0459 | 0.0241 | 1 | -0.1237 | 0.1879 | -0.0910 | 0.0140 | 0.0233 |
| 2 | -0.3605 | 0.1825 | -0.0558 | 0.0390 | 0.0242 | 2 | -0.0691 | 0.1905 | -0.0923 | 0.0072 | 0.0234 |
| 3 | -0.3178 | 0.1794 | -0.0597 | 0.0333 | 0.0239 | 3 | -0.0278 | 0.1932 | -0.0971 | 0.0017 | 0.0237 |
| 5 | -0.1992 | 0.1763 | -0.0759 | 0.0184 | 0.0240 | 5 | 0.0588 | 0.1984 | -0.1100 | -0.0088 | 0.0244 |
| 7 | -0.0819 | 0.1732 | -0.0889 | 0.0035 | 0.0239 | 7 | 0.1547 | 0.2088 | -0.1215 | -0.0205 | 0.0260 |
| 10 | 0.2017 | 0.1856 | -0.0961 | -0.0316 | 0.0254 | 10 | 0.3743 | 0.2229 | -0.1400 | -0.0488 | 0.0287 |

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(c) $x_s/c = 0.30; \delta_s = -0.075; \delta_d/\delta_s = 0.75$

| α, deg | C_L | C_D | C_M | C_l | C_n | α, deg | C_L | C_D | C_M | C_l | C_n |
|---------------|---------|-------|---------|---------|-------|---------------|---------|-------|---------|---------|-------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.4652 | .1705 | -0.0718 | .0555 | .0246 | -3 | -0.5069 | .2626 | -0.0741 | .0615 | .0339 |
| -2 | -0.4734 | .1715 | -0.0657 | .0562 | .0239 | -2 | -0.4778 | .2478 | -0.0772 | .0400 | .0322 |
| -1 | -0.4591 | .1736 | -0.0613 | .0546 | .0237 | -1 | -0.4079 | .2419 | -0.0860 | .0496 | .0314 |
| 0 | -0.4469 | .1746 | -0.0669 | .0521 | .0240 | 0 | -0.3613 | .2354 | -0.0792 | .0439 | .0309 |
| 1 | -0.4285 | .1829 | -0.0478 | .0490 | .0246 | 1 | -0.3380 | .2342 | -0.0717 | .0400 | .0306 |
| 2 | -0.4081 | .1829 | -0.0480 | .0456 | .0247 | 2 | -0.3263 | .2330 | -0.0652 | .0377 | .0221 |
| 3 | -0.3857 | .1818 | -0.0454 | .0468 | .0246 | 3 | -0.2797 | .2301 | -0.0695 | .0333 | .0302 |
| 5 | -0.3143 | .1808 | -0.0534 | .0313 | .0243 | 5 | -0.2273 | .2195 | -0.0708 | .0262 | .0292 |
| 7 | -0.2041 | .1818 | -0.0673 | .0171 | .0246 | 7 | -0.1399 | .2154 | -0.0808 | .0156 | .0287 |
| 10 | -0.0163 | .1890 | -0.0835 | -0.0062 | .0255 | 10 | .0816 | .2124 | -0.0978 | -0.0124 | .0283 |
| 20 | .4877 | .2944 | -0.0890 | -0.0698 | .0394 | 20 | .5594 | .3009 | -0.1212 | -0.0703 | .0380 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.4706 | .1955 | -0.0560 | .0585 | .0265 | $M = 1.00$ | | | | | |
| -2 | -0.4775 | .1962 | -0.0551 | .0585 | .0264 | -3 | -0.4345 | .2566 | -0.0832 | .0539 | .0334 |
| -1 | -0.4872 | .1962 | -0.0546 | .0595 | .0264 | -2 | -0.3788 | .2442 | -0.0959 | .0454 | .0321 |
| 0 | -0.4733 | .1955 | -0.0482 | .0572 | .0262 | -1 | -0.3175 | .2358 | -0.1034 | .0383 | .0310 |
| 1 | -0.4429 | .1976 | -0.0404 | .0528 | .0265 | 0 | -0.2473 | .2324 | -0.1033 | .0303 | .0306 |
| 2 | -0.4249 | .1976 | -0.0356 | .0499 | .0266 | 1 | -0.2005 | .2341 | -0.1036 | .0239 | .0308 |
| 3 | -0.4152 | .1962 | -0.0286 | .0480 | .0263 | 2 | -0.1560 | .2369 | -0.1018 | .0186 | .0312 |
| 5 | -0.3847 | .1906 | -0.0230 | .0429 | .0255 | 3 | -0.1058 | .2380 | -0.1066 | .0129 | .0314 |
| 7 | -0.2865 | .1857 | -0.0403 | .0292 | .0251 | 5 | -0.0111 | .2425 | -0.1209 | .0008 | .0315 |
| 10 | -0.0554 | .1836 | -0.0679 | .0000 | .0252 | 7 | .0780 | .2453 | -0.1344 | -0.0071 | .0320 |
| 20 | .5398 | .2978 | -0.1043 | -0.0734 | .0405 | 10 | .2507 | .2453 | -0.1377 | -0.0317 | .0325 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.5004 | .2106 | -0.0577 | .0609 | .0281 | $M = 1.05$ | | | | | |
| -2 | -0.5719 | .2283 | -0.0536 | .0682 | .0297 | -3 | -0.4067 | .2482 | -0.0803 | .0495 | .0317 |
| -1 | -0.5615 | .2205 | -0.0549 | .0674 | .0290 | -2 | -0.3607 | .2384 | -0.0904 | .0433 | .0306 |
| 0 | -0.5264 | .2139 | -0.0447 | .0634 | .0281 | -1 | -0.3050 | .2303 | -0.0994 | .0371 | .0296 |
| 1 | -0.5004 | .2139 | -0.0394 | .0589 | .0280 | 0 | -0.2333 | .2249 | -0.1004 | .0286 | .0288 |
| 2 | -0.4329 | .2053 | -0.0318 | .0516 | .0272 | 1 | -0.1894 | .2276 | -0.0992 | .0228 | .0291 |
| 3 | -0.4419 | .2053 | -0.0244 | .0516 | .0272 | 2 | -0.1424 | .2303 | -0.1011 | .0172 | .0294 |
| 5 | -0.3965 | .1987 | -0.0292 | .0445 | .0265 | 3 | -0.0931 | .2330 | -0.1034 | .0111 | .0297 |
| 7 | -0.2938 | .1922 | -0.0403 | .0312 | .0258 | 5 | -0.0107 | .2357 | -0.1153 | .0007 | .0301 |
| 10 | -0.0390 | .1823 | -0.0667 | .0000 | .0255 | 7 | .0835 | .2400 | -0.1283 | -0.0104 | .0304 |
| 20 | .5849 | .3126 | -0.1201 | -0.0783 | .0421 | 10 | .2676 | .2455 | -0.1410 | -0.0329 | .0316 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.5529 | .2364 | -0.0685 | .0678 | .0311 | $M = 1.10$ | | | | | |
| -2 | -0.5824 | .2439 | -0.0565 | .0702 | .0316 | -3 | -0.3888 | .2430 | -0.0818 | .0470 | .0307 |
| -1 | -0.5529 | .2364 | -0.0512 | .0661 | .0309 | -2 | -0.3463 | .2346 | -0.0890 | .0418 | .0298 |
| 0 | -0.5136 | .2327 | -0.0448 | .0615 | .0302 | -1 | -0.2955 | .2273 | -0.0968 | .0359 | .0287 |
| 1 | -0.4854 | .2289 | -0.0419 | .0575 | .0301 | 0 | -0.2281 | .2215 | -0.0978 | .0281 | .0279 |
| 2 | -0.4546 | .2246 | -0.0376 | .0534 | .0296 | 1 | -0.1711 | .2257 | -0.0956 | .0210 | .0282 |
| 3 | -0.4116 | .2208 | -0.0372 | .0484 | .0289 | 2 | -0.1296 | .2283 | -0.0972 | .0154 | .0286 |
| 5 | -0.3342 | .2115 | -0.0458 | .0381 | .0281 | 3 | -0.0778 | .2309 | -0.1042 | .0091 | .0287 |
| 7 | -0.2359 | .2034 | -0.0560 | .0252 | .0273 | 5 | -0.0031 | .2336 | -0.1116 | .0000 | .0289 |
| 10 | .0000 | .1959 | -0.0738 | -0.0045 | .0264 | 7 | .0829 | .2362 | -0.1247 | -0.0109 | .0295 |
| 20 | .6070 | .3173 | -0.1288 | -0.0792 | .0424 | 10 | .2696 | .2441 | -0.1350 | -0.0331 | .0304 |

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(d) $x_s/c = 0.30$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α_s , deg | C_L | C_D | C_M | C_l | C_n | α_s , deg | C_L | C_D | C_M | C_l | C_n |
|---------------------|---------|--------|---------|---------|--------|---------------------|---------|--------|---------|---------|--------|
| M = 0.60 | | | | | | M = 0.95 | | | | | |
| -3 | -0.3927 | 0.2071 | -0.0555 | 0.0513 | 0.0292 | -3 | -0.8648 | 0.2958 | 0.1358 | 0.0533 | 0.0379 |
| -2 | -0.3927 | 0.2123 | -0.0499 | 0.0504 | 0.0300 | -2 | -0.3915 | 0.2869 | -0.0533 | 0.0497 | 0.0350 |
| -1 | -0.3682 | 0.2226 | -0.0414 | 0.0470 | 0.0309 | -1 | -0.3623 | 0.2869 | -0.0535 | 0.0462 | 0.0355 |
| 0 | -0.3784 | 0.2309 | -0.0341 | 0.0470 | 0.0318 | 0 | -0.3214 | 0.2692 | -0.0503 | 0.0409 | 0.0363 |
| 1 | -0.3620 | 0.2299 | -0.0278 | 0.0435 | 0.0310 | 1 | -0.3623 | 0.2781 | -0.0397 | 0.0444 | 0.0360 |
| 2 | -0.3682 | 0.2278 | -0.0290 | 0.0423 | 0.0310 | 2 | -0.3389 | 0.2751 | -0.0403 | 0.0497 | 0.0358 |
| 3 | -0.3579 | 0.2278 | -0.0240 | 0.0404 | 0.0310 | 3 | -0.3272 | 0.2674 | -0.0378 | 0.0391 | 0.0350 |
| 5 | -0.3477 | 0.1646 | -0.0148 | 0.0382 | 0.0297 | 5 | -0.2863 | 0.2544 | -0.0339 | 0.0338 | 0.0334 |
| 7 | -0.3150 | 0.2143 | -0.0170 | 0.0323 | 0.0289 | 7 | -0.2220 | 0.2426 | -0.0366 | 0.0258 | 0.0320 |
| 10 | -0.1800 | 0.2092 | -0.0335 | 0.0451 | 0.0281 | 10 | 0.0058 | 0.2278 | -0.0482 | -0.0036 | 0.0297 |
| 20 | 0.3989 | 0.2930 | -0.0931 | -0.0575 | 0.0393 | 20 | 0.5025 | 0.2928 | -0.1152 | -0.0648 | 0.0388 |
| M = 0.80 | | | | | | M = 1.00 | | | | | |
| -3 | -0.3372 | 0.2178 | -0.0605 | 0.0449 | 0.0298 | -3 | -0.3798 | 0.2873 | -0.0651 | 0.0459 | 0.0360 |
| -2 | -0.3192 | 0.2213 | -0.0553 | 0.0426 | 0.0301 | -2 | -0.3239 | 0.2794 | -0.0667 | 0.0396 | 0.0356 |
| -1 | -0.2914 | 0.2283 | -0.0496 | 0.0386 | 0.0307 | -1 | -0.2659 | 0.2794 | -0.0707 | 0.0331 | 0.0355 |
| 0 | -0.3053 | 0.2318 | -0.0401 | 0.0390 | 0.0314 | 0 | -0.2212 | 0.2799 | -0.0744 | 0.0277 | 0.0359 |
| 1 | -0.3331 | 0.2354 | -0.0314 | 0.0407 | 0.0318 | 1 | -0.1877 | 0.2828 | -0.0793 | 0.0229 | 0.0358 |
| 2 | -0.3331 | 0.2354 | -0.0256 | 0.0411 | 0.0314 | 2 | -0.1430 | 0.2816 | -0.0840 | 0.0178 | 0.0361 |
| 3 | -0.3331 | 0.2332 | -0.0189 | 0.0407 | 0.0311 | 3 | -0.1016 | 0.2816 | -0.0886 | 0.0127 | 0.0358 |
| 5 | -0.3455 | 0.2255 | -0.0062 | 0.0401 | 0.0303 | 5 | -0.0279 | 0.2782 | -0.0976 | 0.0034 | 0.0353 |
| 7 | -0.3331 | 0.2185 | -0.0023 | 0.0378 | 0.0292 | 7 | 0.0559 | 0.2771 | -0.1079 | -0.0068 | 0.0353 |
| 10 | -0.1832 | 0.2037 | -0.0083 | 0.0169 | 0.0277 | 10 | 0.2625 | 0.2658 | -0.1089 | -0.0318 | 0.0339 |
| 20 | 0.4371 | 0.2930 | -0.0948 | -0.0601 | 0.0398 | 20 | 0.3854 | 0.2601 | -0.0818 | -0.0476 | 0.0322 |
| M = 0.85 | | | | | | M = 1.05 | | | | | |
| -3 | -0.3271 | 0.2243 | -0.0630 | 0.0438 | 0.0306 | -3 | -0.3563 | 0.2717 | -0.0623 | 0.0457 | 0.0342 |
| -2 | -0.3128 | 0.2243 | -0.0583 | 0.0412 | 0.0305 | -2 | -0.3080 | 0.1576 | -0.0681 | 0.0379 | 0.0337 |
| -1 | -0.2776 | 0.2309 | -0.0535 | 0.0371 | 0.0311 | -1 | -0.2576 | 0.2662 | -0.0680 | 0.0318 | 0.0333 |
| 0 | -0.2737 | 0.2316 | -0.0446 | 0.0359 | 0.0312 | 0 | -0.2039 | 0.2673 | -0.0721 | 0.0263 | 0.0337 |
| 1 | -0.2880 | 0.2323 | -0.0384 | 0.0369 | 0.0312 | 1 | -0.1760 | 0.2695 | -0.0761 | 0.0219 | 0.0337 |
| 2 | -0.3063 | 0.2356 | -0.0277 | 0.0384 | 0.0313 | 2 | -0.1342 | 0.2706 | -0.0809 | 0.0170 | 0.0337 |
| 3 | -0.3154 | 0.2342 | -0.0192 | 0.0396 | 0.0312 | 3 | -0.0944 | 0.2706 | -0.0850 | 0.0117 | 0.0336 |
| 5 | -0.3454 | 0.2342 | -0.0048 | 0.0410 | 0.0308 | 5 | -0.0161 | 0.2706 | -0.0971 | 0.0021 | 0.0334 |
| 7 | -0.3506 | 0.2243 | 0.0015 | 0.0402 | 0.0301 | 7 | 0.0719 | 0.2717 | -0.1026 | -0.0073 | 0.0334 |
| 10 | -0.1694 | 0.2046 | -0.0055 | 0.0159 | 0.0281 | 10 | 0.2662 | 0.2608 | -0.1113 | -0.0318 | 0.0323 |
| 20 | 0.4692 | 0.3035 | -0.1052 | -0.0646 | 0.0407 | 20 | 0.3273 | 0.2282 | -0.0619 | -0.0375 | 0.0279 |
| M = 0.90 | | | | | | M = 1.10 | | | | | |
| -3 | -0.3167 | 0.2290 | -0.0661 | 0.0422 | 0.0313 | -3 | -0.3433 | 0.1369 | -0.0667 | 0.0421 | 0.0335 |
| -2 | -0.2958 | 0.2309 | -0.0613 | 0.0390 | 0.0313 | -2 | -0.2913 | 0.1348 | -0.0671 | 0.0364 | 0.0329 |
| -1 | -0.2687 | 0.2352 | -0.0559 | 0.0543 | 0.0315 | -1 | -0.2424 | 0.1348 | -0.0691 | 0.0305 | 0.0329 |
| 0 | -0.2773 | 0.2433 | -0.0445 | 0.0551 | 0.0322 | 0 | -0.1997 | 0.1353 | -0.0717 | 0.0253 | 0.0330 |
| 1 | -0.2958 | 0.2415 | -0.0358 | 0.0378 | 0.0322 | 1 | -0.1633 | 0.1369 | -0.0741 | 0.0206 | 0.0332 |
| 2 | -0.3328 | 0.2477 | -0.0242 | 0.0422 | 0.0328 | 2 | -0.1186 | 0.1369 | -0.0787 | 0.0153 | 0.0328 |
| 3 | -0.3759 | 0.2496 | -0.0146 | 0.0472 | 0.0332 | 3 | -0.0811 | 0.1364 | -0.0826 | 0.0104 | 0.0326 |
| 5 | -0.3821 | 0.2496 | -0.0095 | 0.0455 | 0.0330 | 5 | 0.0052 | 0.1364 | -0.0936 | 0.0000 | 0.0325 |
| 7 | -0.3044 | 0.2359 | -0.0168 | 0.0352 | 0.0315 | 7 | 0.0811 | 0.1359 | -0.1013 | -0.0092 | 0.0325 |
| 10 | -0.0986 | 0.2134 | -0.0212 | 0.0084 | 0.0289 | 10 | 0.2705 | 0.1280 | -0.0998 | -0.0324 | 0.0312 |
| 20 | 0.5090 | 0.3120 | -0.1170 | -0.0684 | 0.0405 | 20 | -0.0104 | 0.0026 | -0.0016 | 0.0009 | 0.0004 |

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(e) $x_s/c = 0.50$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -2 | -0.6081 | 0.1560 | -0.0567 | 0.0724 | 0.0203 | -3 | -0.6181 | 0.2427 | -0.0532 | 0.0713 | 0.0298 |
| -1 | -0.5918 | 0.1539 | -0.0426 | 0.0686 | 0.0198 | -2 | -0.5598 | 0.2249 | -0.0590 | 0.0642 | 0.0279 |
| 0 | -0.5550 | 0.1508 | -0.0296 | 0.0639 | 0.0194 | -1 | -0.5329 | 0.2072 | -0.0505 | 0.0624 | 0.0253 |
| 1 | -0.5224 | 0.1477 | -0.0270 | 0.0585 | 0.0192 | 0 | -0.4490 | 0.2013 | -0.0541 | 0.0518 | 0.0250 |
| 2 | -0.4652 | 0.1457 | -0.0278 | 0.0515 | 0.0191 | 1 | -0.3732 | 0.1972 | -0.0413 | 0.0426 | 0.0250 |
| 3 | -0.4081 | 0.1457 | -0.0256 | 0.0442 | 0.0190 | 2 | -0.3149 | 0.1937 | -0.0306 | 0.0441 | 0.0245 |
| 5 | -0.2959 | 0.1457 | -0.0220 | 0.0295 | 0.0188 | 3 | -0.2566 | 0.1895 | -0.0310 | 0.0289 | 0.0239 |
| 7 | -0.1530 | 0.1436 | -0.0195 | 0.0119 | 0.0188 | 5 | -0.1574 | 0.1777 | -0.0202 | 0.0172 | 0.0226 |
| 10 | 0.1836 | 0.1539 | -0.0222 | -0.0276 | 0.0200 | 7 | 0.0175 | 0.1748 | -0.0194 | -0.0039 | 0.0222 |
| 20 | 0.5734 | 0.3006 | -0.0548 | -0.0807 | 0.0331 | 10 | 0.2974 | 0.1777 | -0.0157 | -0.0379 | 0.0234 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.7947 | 0.2054 | -0.0374 | 0.0916 | 0.0250 | -3 | -0.5247 | 0.2362 | -0.0688 | 0.0618 | 0.0287 |
| -2 | -0.7476 | 0.1963 | -0.0284 | 0.0857 | 0.0240 | -2 | -0.4688 | 0.2215 | -0.0746 | 0.0550 | 0.0271 |
| -1 | -0.6853 | 0.1829 | -0.0138 | 0.0794 | 0.0227 | -1 | -0.4019 | 0.2119 | -0.0828 | 0.0477 | 0.0260 |
| 0 | -0.6369 | 0.1808 | -0.0054 | 0.0732 | 0.0227 | 0 | -0.3237 | 0.2034 | -0.0877 | 0.0382 | 0.0253 |
| 1 | -0.5870 | 0.1724 | 0.0042 | 0.0669 | 0.0217 | 1 | -0.2456 | 0.2034 | -0.0816 | 0.0290 | 0.0255 |
| 2 | -0.5344 | 0.1689 | 0.0120 | 0.0604 | 0.0211 | 2 | -0.1820 | 0.2034 | -0.0749 | 0.0214 | 0.0256 |
| 3 | -0.4707 | 0.1619 | 0.0139 | 0.0522 | 0.0206 | 3 | -0.1250 | 0.2006 | -0.0719 | 0.0151 | 0.0252 |
| 5 | -0.3461 | 0.1542 | 0.0139 | 0.0364 | 0.0196 | 5 | -0.0112 | 0.1961 | -0.0655 | 0.0008 | 0.0245 |
| 7 | -0.1661 | 0.1451 | 0.0105 | 0.0152 | 0.0188 | 7 | 0.1395 | 0.1905 | -0.0491 | -0.0165 | 0.0240 |
| 10 | 0.2215 | 0.1528 | -0.0061 | -0.0322 | 0.0202 | 10 | 0.3851 | 0.1950 | -0.0402 | -0.0468 | 0.0256 |
| 20 | 0.6022 | 0.3056 | -0.0611 | -0.0819 | 0.0408 | 20 | 0.5693 | 0.2769 | -0.0575 | -0.0706 | 0.0347 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.7802 | 0.2212 | -0.0285 | 0.0805 | 0.0266 | -3 | -0.5094 | 0.2280 | -0.0648 | 0.0616 | 0.0277 |
| -2 | -0.7412 | 0.2080 | -0.0276 | 0.0850 | 0.0252 | -2 | -0.4558 | 0.2156 | -0.0732 | 0.0546 | 0.0263 |
| -1 | -0.6814 | 0.1981 | -0.0106 | 0.0783 | 0.0240 | -1 | -0.3915 | 0.2047 | -0.0806 | 0.0471 | 0.0249 |
| 0 | -0.6137 | 0.1916 | 0.0025 | 0.0706 | 0.0235 | 0 | -0.3217 | 0.1955 | -0.0858 | 0.0398 | 0.0239 |
| 1 | -0.5656 | 0.1850 | 0.0079 | 0.0646 | 0.0230 | 1 | -0.2359 | 0.1955 | -0.0829 | 0.0292 | 0.0245 |
| 2 | -0.5071 | 0.1817 | 0.0113 | 0.0569 | 0.0228 | 2 | -0.1770 | 0.1960 | -0.0757 | 0.0218 | 0.0246 |
| 5 | -0.3251 | 0.1619 | 0.0139 | 0.0340 | 0.0206 | 3 | -0.1180 | 0.1949 | -0.0721 | 0.0153 | 0.0243 |
| 7 | -0.1560 | 0.1521 | 0.0123 | 0.0146 | 0.0195 | 5 | -0.0097 | 0.1922 | -0.0648 | 0.0015 | 0.0238 |
| 10 | 0.2276 | 0.1560 | -0.0028 | -0.0322 | 0.0207 | 7 | 0.1501 | 0.1857 | -0.0519 | -0.0170 | 0.0226 |
| 20 | 0.6397 | 0.3120 | -0.0679 | -0.0860 | 0.0415 | 10 | 0.4183 | 0.2020 | -0.0536 | -0.0491 | 0.0265 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.7252 | 0.2383 | -0.0290 | 0.0845 | 0.0286 | -3 | -0.4936 | 0.2236 | -0.0657 | 0.0594 | 0.0267 |
| -2 | -0.6883 | 0.2184 | -0.0289 | 0.0794 | 0.0261 | -2 | -0.4344 | 0.2094 | -0.0734 | 0.0526 | 0.0253 |
| -1 | -0.6269 | 0.2060 | -0.0280 | 0.0719 | 0.0248 | -1 | -0.3741 | 0.1994 | -0.0800 | 0.0453 | 0.0242 |
| 0 | -0.5347 | 0.1998 | -0.0227 | 0.0611 | 0.0243 | 0 | -0.3066 | 0.2168 | -0.0832 | 0.0378 | 0.0234 |
| 1 | -0.4671 | 0.1966 | -0.0147 | 0.0536 | 0.0241 | 1 | -0.2338 | 0.1920 | -0.0819 | 0.0284 | 0.0235 |
| 2 | -0.4204 | 0.1885 | -0.0076 | 0.0471 | 0.0236 | 2 | -0.1611 | 0.1920 | -0.0719 | 0.0197 | 0.0237 |
| 3 | -0.3626 | 0.1823 | -0.0054 | 0.0402 | 0.0230 | 3 | -0.1143 | 0.1899 | -0.0699 | 0.0145 | 0.0235 |
| 5 | -0.2335 | 0.1736 | -0.0006 | 0.0247 | 0.0219 | 5 | 0.0000 | 0.1873 | -0.0640 | 0.0003 | 0.0231 |
| 7 | -0.0885 | 0.1618 | 0.0033 | 0.0256 | 0.0207 | 7 | 0.1455 | 0.1815 | -0.0503 | -0.0167 | 0.0224 |
| 10 | 0.2520 | 0.1655 | -0.0039 | -0.0342 | 0.0220 | 10 | 0.4105 | 0.1999 | -0.0517 | -0.0490 | 0.0259 |
| 20 | 0.6761 | 0.3211 | -0.0780 | -0.0893 | 0.0410 | | | | | | |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -0.6181 | 0.2427 | -0.0532 | 0.0713 | 0.0298 | | | | | | |
| -2 | -0.5598 | 0.2249 | -0.0590 | 0.0642 | 0.0279 | | | | | | |
| -1 | -0.5329 | 0.2072 | -0.0505 | 0.0624 | 0.0253 | | | | | | |
| 0 | -0.4490 | 0.2013 | -0.0541 | 0.0518 | 0.0250 | | | | | | |
| 1 | -0.3732 | 0.1972 | -0.0413 | 0.0426 | 0.0250 | | | | | | |
| 2 | -0.3149 | 0.1937 | -0.0306 | 0.0441 | 0.0245 | | | | | | |
| 3 | -0.2566 | 0.1895 | -0.0310 | 0.0289 | 0.0239 | | | | | | |
| 5 | -0.1574 | 0.1777 | -0.0202 | 0.0172 | 0.0226 | | | | | | |
| 7 | 0.0175 | 0.1748 | -0.0194 | -0.0039 | 0.0222 | | | | | | |
| 10 | 0.2974 | 0.1777 | -0.0157 | -0.0379 | 0.0234 | | | | | | |
| 20 | 0.6764 | 0.2946 | -0.0765 | -0.0847 | 0.0404 | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.5247 | 0.2362 | -0.0688 | 0.0618 | 0.0287 | | | | | | |
| -2 | -0.4688 | 0.2215 | -0.0746 | 0.0550 | 0.0271 | | | | | | |
| -1 | -0.4019 | 0.2119 | -0.0828 | 0.0477 | 0.0260 | | | | | | |
| 0 | -0.3237 | 0.2034 | -0.0877 | 0.0382 | 0.0253 | | | | | | |
| 1 | -0.2456 | 0.2034 | -0.0816 | 0.0290 | 0.0255 | | | | | | |
| 2 | -0.1820 | 0.2034 | -0.0749 | 0.0214 | 0.0256 | | | | | | |
| 3 | -0.1250 | 0.2006 | -0.0719 | 0.0151 | 0.0252 | | | | | | |
| 5 | -0.0112 | 0.1961 | -0.0655 | 0.0008 | 0.0245 | | | | | | |
| 7 | 0.1395 | 0.1905 | -0.0491 | -0.0165 | 0.0240 | | | | | | |
| 10 | 0.3851 | 0.1950 | -0.0402 | -0.0468 | 0.0256 | | | | | | |
| 20 | 0.5693 | 0.2769 | -0.0575 | -0.0706 | 0.0347 | | | | | | |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.5094 | 0.2280 | -0.0648 | 0.0616 | 0.0277 | | | | | | |
| -2 | -0.4558 | 0.2156 | -0.0732 | 0.0546 | 0.0263 | | | | | | |
| -1 | -0.3915 | 0.2047 | -0.0806 | 0.0471 | 0.0249 | | | | | | |
| 0 | -0.3217 | 0.1955 | -0.0858 | 0.0398 | 0.0239 | | | | | | |
| 1 | -0.2359 | 0.1955 | -0.0829 | 0.0292 | 0.0245 | | | | | | |
| 2 | -0.1770 | 0.1960 | -0.0757 | 0.0218 | 0.0246 | | | | | | |
| 3 | -0.1180 | 0.1949 | -0.0721 | 0.0153 | 0.0243 | | | | | | |
| 5 | -0.0097 | 0.1922 | -0.0648 | 0.0015 | 0.0238 | | | | | | |
| 7 | 0.1501 | 0.1857 | -0.0519 | -0.0170 | 0.0226 | | | | | | |
| 10 | 0.4183 | 0.2020 | -0.0536 | -0.0491 | 0.0265 | | | | | | |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.4936 | 0.2236 | -0.0657 | 0.0594 | 0.0267 | | | | | | |
| -2 | -0.4344 | 0.2094 | -0.0734 | 0.0526 | 0.0253 | | | | | | |
| -1 | -0.3741 | 0.1994 | -0.0800 | 0.0453 | 0.0242 | | | | | | |
| 0 | -0.3066 | 0.2168 | -0.0832 | 0.0378 | 0.0234 | | | | | | |
| 1 | -0.2338 | 0.1920 | -0.0819 | 0.0284 | 0.0235 | | | | | | |
| 2 | -0.1611 | 0.1920 | -0.0719 | 0.0197 | 0.0237 | | | | | | |
| 3 | -0.1143 | 0.1899 | -0.0699 | 0.0145 | 0.0235 | | | | | | |
| 5 | 0.0000 | 0.1873 | -0.0640 | 0.0003 | 0.0231 | | | | | | |
| 7 | 0.1455 | 0.1815 | -0.0503 | -0.0167 | 0.0224 | | | | | | |
| 10 | 0.4105 | 0.1999 | -0.0517 | -0.0490 | 0.0259 | | | | | | |

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

$$(f) \quad x_S/c = 0.50; \delta_S = -0.075; \delta_d/\delta_S = 0.75$$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.7088 | 0.2005 | -0.0192 | 0.0852 | 0.0262 | -3 | -0.6776 | 0.2820 | -0.0478 | 0.0792 | 0.0390 |
| -2 | -0.6804 | 0.2005 | -0.0072 | 0.0824 | 0.0261 | -2 | -0.6312 | 0.2702 | -0.0509 | 0.0737 | 0.0333 |
| -1 | -0.6296 | 0.2005 | 0.0021 | 0.0760 | 0.0259 | -1 | -0.5570 | 0.2585 | -0.0544 | 0.0658 | 0.0321 |
| 0 | -0.6052 | 0.2056 | 0.0150 | 0.0723 | 0.0261 | 0 | -0.4873 | 0.2497 | -0.0340 | 0.0579 | 0.0311 |
| 1 | -0.5788 | 0.2015 | 0.0188 | 0.0682 | 0.0259 | 1 | -0.4467 | 0.2455 | -0.0186 | 0.0526 | 0.0304 |
| 2 | -0.5484 | 0.1974 | 0.0234 | 0.0642 | 0.0253 | 2 | -0.4119 | 0.2379 | -0.0014 | 0.0482 | 0.0296 |
| 3 | -0.5077 | 0.1954 | 0.0361 | 0.0580 | 0.0246 | 3 | -0.3481 | 0.2350 | -0.0022 | 0.0420 | 0.0289 |
| 5 | -0.4387 | 0.1851 | 0.0405 | 0.0488 | 0.0236 | 5 | -0.2553 | 0.2185 | 0.0108 | 0.0296 | 0.0271 |
| 7 | -0.3290 | 0.1748 | 0.0445 | 0.0349 | 0.0223 | 7 | -0.1160 | 0.2085 | 0.0208 | 0.0129 | 0.0258 |
| 10 | -0.0305 | 0.1676 | 0.0371 | -0.0006 | 0.0215 | 10 | 0.1450 | 0.2027 | 0.0188 | -0.0286 | 0.0256 |
| 20 | 0.4021 | 0.2879 | -0.0282 | -0.0577 | 0.0370 | 20 | 0.4235 | 0.2761 | -0.0218 | -0.0542 | 0.0346 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.7439 | 0.2371 | -0.0293 | 0.0880 | 0.0298 | -3 | -0.5988 | 0.2790 | -0.0645 | 0.0695 | 0.0343 |
| -2 | -0.6502 | 0.2232 | -0.0205 | 0.0785 | 0.0281 | -2 | -0.5433 | 0.2666 | -0.0735 | 0.0629 | 0.0330 |
| -1 | -0.5854 | 0.2211 | -0.0087 | 0.0708 | 0.0275 | -1 | -0.4823 | 0.2543 | -0.0786 | 0.0555 | 0.0318 |
| 0 | -0.5469 | 0.2197 | 0.0018 | 0.0658 | 0.0273 | 0 | -0.3881 | 0.2470 | -0.0767 | 0.0367 | 0.0311 |
| 1 | -0.5097 | 0.2127 | 0.0109 | 0.0612 | 0.0317 | 1 | -0.3215 | 0.2470 | -0.0680 | 0.0369 | 0.0311 |
| 2 | -0.4711 | 0.2057 | 0.0215 | 0.0563 | 0.0260 | 2 | -0.2628 | 0.2470 | -0.0599 | 0.0302 | 0.0311 |
| 3 | -0.4449 | 0.2022 | 0.0314 | 0.0530 | 0.0255 | 3 | -0.2085 | 0.2442 | -0.0550 | 0.0239 | 0.0305 |
| 5 | -0.3885 | 0.1953 | 0.0505 | 0.0457 | 0.0245 | 5 | -0.1053 | 0.2369 | -0.0482 | 0.0116 | 0.0296 |
| 7 | -0.2783 | 0.1820 | 0.0655 | 0.0320 | 0.0230 | 7 | 0.0333 | 0.2290 | -0.0355 | -0.0052 | 0.0283 |
| 10 | -0.0055 | 0.1702 | 0.0603 | -0.0019 | 0.0216 | 10 | 0.2994 | 0.2302 | -0.0294 | -0.0371 | 0.0291 |
| 20 | 0.4339 | 0.2873 | -0.0283 | -0.0591 | 0.0376 | 20 | 0.3548 | 0.2442 | -0.0035 | -0.0450 | 0.0299 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.7633 | 0.2489 | -0.0232 | 0.0901 | 0.0309 | -3 | -0.5753 | 0.2697 | -0.0633 | 0.0670 | 0.0334 |
| -2 | -0.6909 | 0.2338 | -0.0157 | 0.0826 | 0.0293 | -2 | -0.5167 | 0.2573 | -0.0725 | 0.0604 | 0.0320 |
| -1 | -0.5822 | 0.2260 | -0.0091 | 0.0706 | 0.0280 | -1 | -0.4634 | 0.2465 | -0.0768 | 0.0539 | 0.0306 |
| 0 | -0.5304 | 0.2194 | 0.0023 | 0.0645 | 0.0275 | 0 | -0.3888 | 0.2378 | -0.0786 | 0.0457 | 0.0298 |
| 1 | -0.4981 | 0.2181 | 0.0178 | 0.0600 | 0.0271 | 1 | -0.3132 | 0.2384 | -0.0687 | 0.0360 | 0.0300 |
| 2 | -0.4722 | 0.2161 | 0.0256 | 0.0566 | 0.0270 | 2 | -0.2557 | 0.2384 | -0.0592 | 0.0298 | 0.0298 |
| 3 | -0.4528 | 0.2129 | 0.0396 | 0.0547 | 0.0264 | 3 | -0.2024 | 0.2362 | -0.0539 | 0.0240 | 0.0295 |
| 5 | -0.4140 | 0.2050 | 0.0606 | 0.0488 | 0.0255 | 5 | -0.0959 | 0.2292 | -0.0467 | 0.0109 | 0.0286 |
| 7 | -0.2846 | 0.1880 | 0.0729 | 0.0328 | 0.0234 | 7 | 0.0426 | 0.2211 | -0.0352 | -0.0060 | 0.0276 |
| 10 | 0.0039 | 0.1768 | 0.0655 | -0.0024 | 0.0223 | 10 | 0.3036 | 0.2254 | -0.0327 | -0.0368 | 0.0287 |
| 20 | 0.4567 | 0.2915 | -0.0302 | -0.0610 | 0.0378 | | | | | | |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.7583 | 0.2662 | -0.0206 | 0.0904 | 0.0325 | -3 | -0.5473 | 0.2614 | -0.0633 | 0.0642 | 0.0322 |
| -2 | -0.7387 | 0.2600 | -0.0115 | 0.0772 | 0.0319 | -2 | -0.5008 | 0.2494 | -0.0691 | 0.0587 | 0.0310 |
| -1 | -0.6678 | 0.2520 | -0.0065 | 0.0786 | 0.0312 | -1 | -0.4440 | 0.2378 | -0.0728 | 0.0523 | 0.0297 |
| 0 | -0.5993 | 0.2477 | 0.0119 | 0.0720 | 0.0305 | 0 | -0.3769 | 0.2300 | -0.0750 | 0.0444 | 0.0289 |
| 1 | -0.5503 | 0.2415 | 0.0202 | 0.0653 | 0.0300 | 1 | -0.2736 | 0.2326 | -0.0614 | 0.0327 | 0.0289 |
| 2 | -0.5075 | 0.2365 | 0.0296 | 0.0602 | 0.0294 | 2 | -0.2427 | 0.2326 | -0.0569 | 0.0287 | 0.0289 |
| 3 | -0.4586 | 0.2291 | 0.0339 | 0.0550 | 0.0285 | 3 | -0.1807 | 0.2290 | -0.0532 | 0.0217 | 0.0285 |
| 5 | -0.3608 | 0.2124 | 0.0460 | 0.0424 | 0.0264 | 5 | -0.0826 | 0.2248 | -0.0450 | 0.0097 | 0.0275 |
| 7 | -0.2140 | 0.1950 | 0.0530 | 0.0253 | 0.0242 | 7 | 0.0723 | 0.2180 | -0.0332 | -0.0089 | 0.0264 |
| 10 | 0.0550 | 0.1857 | 0.0492 | -0.0084 | 0.0232 | 10 | 0.3098 | 0.2243 | -0.0311 | -0.0380 | 0.0280 |
| 20 | 0.4892 | 0.3034 | -0.0372 | -0.0643 | 0.0388 | | | | | | |
| $M = 0.95$ | | | | | | | | | | | |
| -3 | -0.6776 | 0.2820 | -0.0478 | 0.0792 | 0.0390 | -3 | -0.5988 | 0.2790 | -0.0645 | 0.0695 | 0.0343 |
| -2 | -0.6312 | 0.2702 | -0.0509 | 0.0737 | 0.0333 | -2 | -0.5433 | 0.2666 | -0.0735 | 0.0629 | 0.0330 |
| -1 | -0.5570 | 0.2585 | -0.0544 | 0.0658 | 0.0321 | -1 | -0.4823 | 0.2543 | -0.0786 | 0.0555 | 0.0318 |
| 0 | -0.4873 | 0.2497 | -0.0340 | 0.0579 | 0.0311 | 0 | -0.3881 | 0.2470 | -0.0767 | 0.0367 | 0.0311 |
| 1 | -0.4467 | 0.2455 | -0.0186 | 0.0526 | 0.0304 | 1 | -0.3215 | 0.2470 | -0.0680 | 0.0369 | 0.0311 |
| 2 | -0.4119 | 0.2379 | -0.0014 | 0.0482 | 0.0296 | 2 | -0.2628 | 0.2470 | -0.0599 | 0.0302 | 0.0311 |
| 3 | -0.3481 | 0.2350 | -0.0022 | 0.0420 | 0.0289 | 3 | -0.2085 | 0.2442 | -0.0550 | 0.0239 | 0.0305 |
| 5 | -0.2553 | 0.2185 | 0.0108 | 0.0296 | 0.0271 | 5 | -0.1053 | 0.2369 | -0.0482 | 0.0116 | 0.0296 |
| 7 | -0.1160 | 0.2085 | 0.0208 | 0.0129 | 0.0258 | 7 | 0.0333 | 0.2290 | -0.0355 | -0.0052 | 0.0283 |
| 10 | 0.1450 | 0.2027 | 0.0188 | -0.0286 | 0.0256 | 10 | 0.2994 | 0.2302 | -0.0294 | -0.0371 | 0.0291 |
| 20 | 0.4235 | 0.2761 | -0.0218 | -0.0542 | 0.0346 | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.5988 | 0.2790 | -0.0645 | 0.0695 | 0.0343 | -3 | -0.5753 | 0.2697 | -0.0633 | 0.0670 | 0.0334 |
| -2 | -0.5433 | 0.2666 | -0.0735 | 0.0629 | 0.0330 | -2 | -0.5167 | 0.2573 | -0.0725 | 0.0604 | 0.0320 |
| -1 | -0.4823 | 0.2543 | -0.0786 | 0.0555 | 0.0318 | -1 | -0.4634 | 0.2465 | -0.0768 | 0.0539 | 0.0306 |
| 0 | -0.3881 | 0.2470 | -0.0767 | 0.0367 | 0.0311 | 0 | -0.3888 | 0.2378 | -0.0786 | 0.0457 | 0.0298 |
| 1 | -0.3215 | 0.2470 | -0.0680 | 0.0369 | 0.0311 | 1 | -0.3132 | 0.2384 | -0.0687 | 0.0360 | 0.0300 |
| 2 | -0.2628 | 0.2470 | -0.0599 | 0.0302 | 0.0311 | 2 | -0.2557 | 0.2384 | -0.0592 | 0.0298 | 0.0298 |
| 3 | -0.2085 | 0.2442 | -0.0550 | 0.0239 | 0.0305 | 3 | -0.2024 | 0.2362 | -0.0539 | 0.0240 | 0.0295 |
| 5 | -0.1053 | 0.2369 | -0.0482 | 0.0116 | 0.0296 | 5 | -0.0959 | 0.2292 | -0.0467 | 0.0109 | 0.0286 |
| 7 | 0.0333 | 0.2290 | -0.0355 | -0.0052 | 0.0283 | 7 | 0.0426 | 0.2211 | -0.0352 | -0.0060 | 0.0276 |
| 10 | 0.2994 | 0.2302 | -0.0294 | -0.0371 | 0.0291 | 10 | 0.3036 | 0.2254 | -0.0327 | -0.0368 | 0.0287 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.5753 | 0.2697 | -0.0633 | 0.0670 | 0.0334 | -3 | -0.5473 | 0.2614 | -0.0633 | 0.0642 | 0.0322 |
| -2 | -0.5167 | 0.2573 | -0.0725 | 0.0604 | 0.0320 | -2 | -0.5008 | 0.2494 | -0.0691 | 0.0587 | 0.0310 |
| -1 | -0.4634 | 0.2465 | -0.0768 | 0.0539 | 0.0306 | -1 | -0.4440 | 0.2378 | -0.0728 | 0.0523 | 0.0297 |
| 0 | -0.3888 | 0.2378 | -0.0786 | 0.0457 | 0.0298 | 0 | -0.3769 | 0.2300 | -0.0750 | 0.0444 | 0.0289 |
| 1 | -0.3132 | 0.2384 | -0.0687 | 0.0360 | 0.0300 | 1 | -0.2736 | 0.2326 | -0.0614 | 0.0327 | 0.0289 |
| 2 | -0.2557 | 0.2384 | -0.0592 | 0.0298 | 0.0298 | 2 | -0.2427 | 0.2326 | -0.0569 | 0.0287 | 0.0289 |
| 3 | -0.2024 | 0.2362 | -0.0539 | 0.0240 | 0.0295 | 3 | -0.1807 | 0.2290 | -0.0532 | 0.0217 | 0.0285 |
| 5 | -0.0959 | 0.2292 | -0.0467 | 0.0109 | 0.0286 | 5 | -0.0826 | 0.2248 | -0.0450 | 0.0097 | 0.0275 |
| 7 | 0.0426 | 0.2211 | -0.0352 | -0.0060 | 0.0276 | 7 | 0.0723 | 0.2180 | -0.0332 | -0.0089 | 0.0264 |
| 10 | 0.2994 | 0.2254 | -0.0327 | -0.0368 | 0.0287 | 10 | 0.3098 | 0.2243 | -0.0311 | -0.0380 | 0.0280 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.5473 | 0.2614 | -0.0633 | 0.0642 | 0.0322 | -3 | -0.5473 | 0.2614 | -0.0633 | 0.0642 | 0.0322 |
| -2 | -0.5008 | 0.2494 | -0.0691 | 0.0587 | 0.0310 | -2 | -0.5008 | 0.2494 | -0.0691 | 0.0587 | 0.0310 |
| -1 | -0.4440 | 0.2378 | -0.0728 | 0.0523 | 0.0297 | -1 | -0.4440 | 0.2378 | -0.0728 | 0.0523 | 0.0297 |
| 0 | -0.3769 | 0.2300 | -0.0750 | 0.0444 | 0.0289 | 0 | -0.3769 | 0.2300 | -0.0750 | 0.0444 | 0.0289 |
| 1 | -0.2736 | 0.2326 | -0.0614 | 0.0327 | 0.0289 | 1 | -0.2736 | 0.2326 | -0.0614 | 0.0327 | 0.0289 |
| 2 | -0.2427 | 0.2326 | -0.0569 | 0.0287 | 0.0289 | 2 | -0.2427 | 0.2326 | -0.0569 | 0.0287 | 0.0289 |
| 3 | -0.1807 | 0.2290 | -0.0532 | 0.0217 | 0.0285 | 3 | -0.1807 | 0.2290 | -0.0532 | 0.0217 | 0.0285 |
| 5 | -0.0826 | 0.2248 | -0.0450 | 0.0097 | 0.0275 | 5 | -0.0826 | 0.2248 | -0.0450 | 0.0097 | 0.0275 |
| 7 | 0.0723 | 0.2180 | -0.0332 | -0.0089 | 0.0264 | 7 | 0.0723 | 0.2180 | -0.0332 | -0.0089 | 0.0264 |
| 10 | 0.3098 | 0.2243 | -0.0311 | -0.0380 | 0.0280 | 10 | 0.3098 | 0.2243 | -0.0311 | -0.0380 | 0.0280 |

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(g) $x_s/c = 0.50$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α , deg | c_L | c_D | c_M | c_l | c_n | α , deg | c_L | c_D | c_M | c_l | c_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.5965 | 0.2211 | -0.0179 | 0.0758 | 0.0295 | -3 | -0.6245 | 0.2974 | -0.0472 | 0.0735 | 0.0375 |
| -2 | -0.4793 | 0.2191 | -0.0169 | 0.0609 | 0.0295 | -2 | -0.5320 | 0.2974 | -0.0424 | 0.0638 | 0.0367 |
| -1 | -0.4206 | 0.2232 | -0.0110 | 0.0536 | 0.0295 | -1 | -0.4799 | 0.2916 | -0.0226 | 0.0577 | 0.0358 |
| 0 | -0.3963 | 0.2242 | 0.0001 | 0.0512 | 0.0293 | 0 | -0.4279 | 0.2916 | -0.0094 | 0.0515 | 0.0362 |
| 1 | -0.3842 | 0.2242 | 0.0028 | 0.0489 | 0.0295 | 1 | -0.4001 | 0.2763 | 0.0086 | 0.0480 | 0.0346 |
| 2 | -0.3680 | 0.2232 | 0.0108 | 0.0466 | 0.0293 | 2 | -0.3770 | 0.2717 | 0.0177 | 0.0454 | 0.0338 |
| 3 | -0.3478 | 0.2211 | 0.0245 | 0.0438 | 0.0287 | 3 | -0.3585 | 0.2635 | 0.0305 | 0.0436 | 0.0334 |
| 5 | -0.3175 | 0.2160 | 0.0416 | 0.0386 | 0.0281 | 5 | -0.2880 | 0.2506 | 0.0513 | 0.0352 | 0.0317 |
| 7 | -0.2548 | 0.2048 | 0.0570 | 0.0300 | 0.0267 | 7 | -0.1561 | 0.2389 | 0.0589 | 0.0197 | 0.0303 |
| 10 | -0.0849 | 0.1986 | 0.0694 | 0.0078 | 0.0258 | 10 | 0.0405 | 0.2377 | 0.0547 | -0.0053 | 0.0295 |
| 20 | 0.2447 | 0.2754 | 0.0349 | -0.0361 | 0.0350 | 20 | 0.2949 | 0.2799 | 0.0449 | -0.0390 | 0.0354 |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.5447 | 0.2389 | -0.0393 | 0.0670 | 0.0309 | -3 | -0.5857 | 0.3077 | 0.0470 | 0.0694 | 0.0387 |
| -2 | -0.4665 | 0.2334 | -0.0368 | 0.0580 | 0.0304 | -2 | -0.5006 | 0.0783 | 0.0284 | 0.0586 | 0.0382 |
| -1 | -0.4157 | 0.2341 | -0.0267 | 0.0517 | 0.0304 | -1 | -0.4045 | 0.2976 | 0.0220 | 0.0480 | 0.0378 |
| 0 | -0.3883 | 0.2355 | -0.0161 | 0.0980 | 0.0303 | 0 | -0.3426 | 0.2954 | -0.0518 | 0.0408 | 0.0377 |
| 1 | -0.3691 | 0.2334 | -0.0066 | 0.0459 | 0.0303 | 1 | -0.3050 | 0.2954 | -0.0441 | 0.0358 | 0.0375 |
| 2 | -0.3430 | 0.2320 | 0.0031 | 0.0430 | 0.0299 | 2 | -0.2564 | 0.2943 | -0.0380 | 0.0304 | 0.0372 |
| 3 | -0.3224 | 0.2306 | 0.0150 | 0.0405 | 0.0296 | 3 | -0.2100 | 0.2898 | -0.0349 | 0.0245 | 0.0367 |
| 5 | -0.2703 | 0.2216 | 0.0376 | 0.0340 | 0.0284 | 5 | -0.1127 | 0.2786 | -0.0241 | 0.0131 | 0.0352 |
| 7 | -0.1921 | 0.2112 | 0.0566 | 0.0236 | 0.0269 | 7 | 0.0442 | 0.2708 | -0.0162 | -0.0045 | 0.0339 |
| 10 | -0.0206 | 0.2077 | 0.0690 | 0.0008 | 0.0268 | 10 | 0.2630 | 0.2730 | -0.0143 | -0.0321 | 0.0348 |
| 20 | 0.2566 | 0.2771 | 0.0453 | -0.0369 | 0.0358 | 20 | 0.2486 | 0.2562 | 0.0557 | -0.0323 | 0.0317 |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.5478 | 0.2473 | -0.0439 | 0.0672 | 0.0319 | -3 | -0.5585 | 0.3032 | -0.0615 | 0.0654 | 0.0379 |
| -2 | -0.4705 | 0.2388 | -0.0407 | 0.0580 | 0.0311 | -2 | -0.4778 | 0.2903 | -0.0652 | 0.0562 | 0.0367 |
| -1 | -0.4151 | 0.2375 | -0.0322 | 0.0517 | 0.0308 | -1 | -0.3886 | 0.2849 | -0.0585 | 0.0462 | 0.0361 |
| 0 | -0.3867 | 0.2375 | -0.0169 | 0.0484 | 0.0308 | 0 | -0.3238 | 0.2838 | -0.0511 | 0.0389 | 0.0361 |
| 1 | -0.3674 | 0.2375 | -0.0065 | 0.0455 | 0.0307 | 1 | -0.2867 | 0.2849 | -0.0409 | 0.0344 | 0.0358 |
| 2 | -0.3390 | 0.2356 | 0.0047 | 0.0423 | 0.0305 | 2 | -0.2442 | 0.2838 | -0.0386 | 0.0291 | 0.0356 |
| 3 | -0.3145 | 0.2343 | 0.0177 | 0.0392 | 0.0302 | 3 | -0.1943 | 0.2784 | -0.0338 | 0.0231 | 0.0352 |
| 5 | -0.2668 | 0.2271 | 0.0399 | 0.0331 | 0.0291 | 5 | -0.0956 | 0.2709 | -0.0261 | 0.0115 | 0.0337 |
| 7 | -0.1689 | 0.2140 | 0.0657 | 0.0212 | 0.0276 | 7 | 0.0478 | 0.2623 | -0.0157 | -0.0056 | 0.0325 |
| 10 | -0.0129 | 0.2121 | 0.0733 | -0.0002 | 0.0272 | 10 | 0.2622 | 0.2645 | -0.0146 | -0.0318 | 0.0334 |
| 20 | 0.2746 | 0.2800 | 0.0486 | -0.0386 | 0.0363 | 20 | 0.2177 | 0.2408 | 0.0593 | -0.0294 | 0.0291 |
| $M = 0.90$ | | | | | | | | | | | |
| -3 | -0.5717 | 0.2604 | -0.0482 | 0.0686 | 0.0334 | -3 | -0.5245 | 0.2905 | -0.0609 | 0.0622 | 0.0368 |
| -2 | -0.4741 | 0.2481 | -0.0491 | 0.0580 | 0.0322 | -2 | -0.4494 | 0.2791 | -0.0619 | 0.0530 | 0.0355 |
| -1 | -0.4205 | 0.2487 | -0.0336 | 0.0515 | 0.0320 | -1 | -0.3713 | 0.2249 | -0.0558 | 0.0435 | 0.0349 |
| 0 | -0.4035 | 0.2493 | -0.0123 | 0.0484 | 0.0318 | 0 | -0.3137 | 0.2749 | -0.0467 | 0.0377 | 0.0349 |
| 1 | -0.3693 | 0.2481 | -0.0060 | 0.0450 | 0.0317 | 1 | -0.2633 | 0.2759 | -0.0384 | 0.0317 | 0.0693 |
| 2 | -0.3474 | 0.2462 | 0.0083 | 0.0422 | 0.0313 | 2 | -0.2252 | 0.2749 | -0.0341 | 0.0270 | 0.0688 |
| 3 | -0.3254 | 0.2419 | 0.0217 | 0.0397 | 0.0309 | 3 | -0.1707 | 0.2707 | -0.0334 | 0.0208 | 0.0675 |
| 5 | -0.2743 | 0.2333 | 0.0465 | 0.0335 | 0.0297 | 5 | -0.0720 | 0.2645 | -0.0210 | 0.0088 | 0.0648 |
| 7 | -0.1780 | 0.2234 | 0.0664 | 0.0219 | 0.0287 | 7 | 0.0720 | 0.2562 | -0.0142 | -0.0089 | 0.0630 |
| 10 | -0.0195 | 0.2215 | 0.0760 | 0.0013 | 0.0283 | 10 | 0.2756 | 0.2624 | -0.0154 | -0.0336 | 0.0652 |
| 20 | 0.3084 | 0.2913 | 0.0427 | -0.0421 | 0.0373 | 20 | 0.2160 | 0.2385 | 0.0569 | -0.0285 | 0.0569 |
| $M = 1.00$ | | | | | | | | | | | |
| -3 | -0.5857 | 0.3077 | 0.0470 | 0.0694 | 0.0387 | -3 | -0.5585 | 0.3032 | -0.0615 | 0.0654 | 0.0379 |
| -2 | -0.5006 | 0.0783 | 0.0284 | 0.0586 | 0.0382 | -2 | -0.4778 | 0.2903 | -0.0652 | 0.0562 | 0.0367 |
| -1 | -0.4045 | 0.2976 | 0.0220 | 0.0480 | 0.0378 | -1 | -0.3886 | 0.2849 | -0.0585 | 0.0462 | 0.0361 |
| 0 | -0.3426 | 0.2954 | -0.0518 | 0.0408 | 0.0377 | 0 | -0.3238 | 0.2838 | -0.0511 | 0.0389 | 0.0361 |
| 1 | -0.3050 | 0.2954 | -0.0441 | 0.0358 | 0.0375 | 1 | -0.2867 | 0.2849 | -0.0409 | 0.0344 | 0.0358 |
| 2 | -0.2564 | 0.2943 | -0.0380 | 0.0304 | 0.0372 | 2 | -0.2442 | 0.2838 | -0.0386 | 0.0291 | 0.0356 |
| 3 | -0.2100 | 0.2898 | -0.0349 | 0.0245 | 0.0367 | 3 | -0.1943 | 0.2784 | -0.0338 | 0.0231 | 0.0352 |
| 5 | -0.1127 | 0.2786 | -0.0241 | 0.0131 | 0.0352 | 5 | -0.0956 | 0.2709 | -0.0261 | 0.0115 | 0.0337 |
| 7 | 0.0442 | 0.2708 | -0.0162 | -0.0045 | 0.0339 | 7 | 0.0478 | 0.2623 | -0.0157 | -0.0056 | 0.0325 |
| 10 | 0.2630 | 0.2730 | -0.0143 | -0.0321 | 0.0348 | 10 | 0.2622 | 0.2645 | -0.0146 | -0.0318 | 0.0334 |
| 20 | 0.2486 | 0.2562 | 0.0557 | -0.0323 | 0.0317 | 20 | 0.2177 | 0.2408 | 0.0593 | -0.0294 | 0.0291 |
| $M = 1.05$ | | | | | | | | | | | |
| -3 | -0.5585 | 0.3032 | -0.0615 | 0.0654 | 0.0379 | -3 | -0.5585 | 0.3032 | -0.0615 | 0.0654 | 0.0379 |
| -2 | -0.4778 | 0.2903 | -0.0652 | 0.0562 | 0.0367 | -2 | -0.4778 | 0.2903 | -0.0652 | 0.0562 | 0.0367 |
| -1 | -0.3886 | 0.2849 | -0.0585 | 0.0462 | 0.0361 | -1 | -0.3886 | 0.2849 | -0.0585 | 0.0462 | 0.0361 |
| 0 | -0.3238 | 0.2838 | -0.0511 | 0.0389 | 0.0361 | 0 | -0.3238 | 0.2838 | -0.0511 | 0.0389 | 0.0361 |
| 1 | -0.2867 | 0.2849 | -0.0409 | 0.0344 | 0.0358 | 1 | -0.2867 | 0.2849 | -0.0409 | 0.0344 | 0.0358 |
| 2 | -0.2442 | 0.2838 | -0.0386 | 0.0291 | 0.0356 | 2 | -0.2442 | 0.2838 | -0.0386 | 0.0291 | 0.0356 |
| 3 | -0.1943 | 0.2784 | -0.0338 | 0.0231 | 0.0352 | 3 | -0.1943 | 0.2784 | -0.0338 | 0.0231 | 0.0352 |
| 5 | -0.0956 | 0.2709 | -0.0261 | 0.0115 | 0.0337 | 5 | -0.0956 | 0.2709 | -0.0261 | 0.0115 | 0.0337 |
| 7 | 0.0478 | 0.2623 | -0.0157 | -0.0056 | 0.0325 | 7 | 0.0478 | 0.2623 | -0.0157 | -0.0056 | 0.0325 |
| 10 | 0.2622 | 0.2645 | -0.0146 | -0.0318 | 0.0334 | 10 | 0.2622 | 0.2645 | -0.0146 | -0.0318 | 0.0334 |
| 20 | 0.2177 | 0.2408 | 0.0593 | -0.0294 | 0.0291 | 20 | 0.2177 | 0.2408 | 0.0593 | -0.0294 | 0.0291 |
| $M = 1.10$ | | | | | | | | | | | |
| -3 | -0.5245 | 0.2905 | -0.0609 | 0.0622 | 0.0368 | -3 | -0.5245 | 0.2905 | -0.0609 | 0.0622 | 0.0368 |
| -2 | -0.4494 | 0.2791 | -0.0619 | 0.0530 | 0.0355 | -2 | -0.4494 | 0.2791 | -0.0619 | 0.0530 | 0.0355 |
| -1 | -0.3713 | 0.2249 | -0.0558 | 0.0435 | 0.0349 | -1 | -0.3713 | 0.2249 | -0.0558 | 0.0435 | 0.0349 |
| 0 | -0.3137 | 0.2749 | -0.0467 | 0.0377 | 0.0349 | 0 | -0.3137 | 0.2749 | -0.0467 | 0.0377 | 0.0349 |
| 1 | -0.2633 | 0.2759 | -0.0384 | 0.0317 | 0.0693 | 1 | -0.2633 | 0.2759 | -0.0384 | 0.0317 | 0.0693 |
| 2 | -0.2252 | 0.2749 | -0.0341 | 0.0270 | 0.0688 | 2 | -0.2252 | 0.2749 | -0.0341 | 0.0270 | 0.0688 |
| 3 | -0.1707 | 0.2707 | -0.0334 | 0.0208 | 0.0675 | 3 | -0.1707 | 0.2707 | -0.0334 | 0.0208 | 0.0675 |
| 5 | -0.0720 | 0.2645 | -0.0210 | 0.0088 | 0.0648 | 5 | -0.0720 | 0.2645 | -0.0210 | 0.0088 | 0.0648 |
| 7 | 0.0720 | 0.2562 | -0.0142 | -0.0089 | 0.0630 | 7 | 0.0720 | 0.2562 | -0.0142 | -0.0089 | 0.0630 |
| 10 | 0.2756 | 0.2624 | -0.0154 | -0.0336 | 0.0652 | 10 | 0.2756 | 0.2624 | -0.0154 | -0.0336 | 0.0652 |
| 20 | 0.2160 | 0.2385 | 0.0569 | -0.0285 | 0.0569 | 20 | 0.2160 | 0.2385 | 0.0569 | -0.0285 | 0.0569 |

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(h) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α , deg | C_L | C_D | C_M | C_l | C_n | | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|--|-------------------|---------|--------|--------|------------|--------|
| $M = 0.60$ | | | | | | | | | | | $M = 0.95$ | |
| -3 | -0.8280 | 0.1710 | 0.0439 | 0.0977 | 0.0215 | | -3 | -0.7364 | 0.2434 | 0.0317 | 0.0842 | 0.0282 |
| -2 | -0.7832 | 0.1607 | 0.0577 | 0.0925 | 0.0203 | | -2 | -0.6853 | 0.2211 | 0.0324 | 0.0780 | 0.0260 |
| -1 | -0.7405 | 0.1545 | 0.0754 | 0.0872 | 0.0190 | | -1 | -0.6110 | 0.2070 | 0.0269 | 0.0694 | 0.0245 |
| 0 | -0.6897 | 0.1463 | 0.0842 | 0.0810 | 0.0185 | | 0 | -0.5622 | 0.2023 | 0.0194 | 0.0643 | 0.0240 |
| 1 | -0.6408 | 0.1442 | 0.0856 | 0.0752 | 0.0182 | | 1 | -0.3798 | 0.1888 | 0.0096 | 0.0509 | 0.0229 |
| 2 | -0.5798 | 0.1360 | 0.0868 | 0.0677 | 0.0173 | | 2 | -0.3659 | 0.1817 | 0.0352 | 0.0429 | 0.0220 |
| 3 | -0.5188 | 0.1339 | 0.0936 | 0.0600 | 0.0166 | | 3 | -0.2729 | 0.1782 | 0.0366 | 0.0327 | 0.0215 |
| 5 | -0.3784 | 0.1236 | 0.1006 | 0.0430 | 0.0153 | | 5 | -0.1045 | 0.1658 | 0.0555 | 0.0132 | 0.0201 |
| 7 | -0.2034 | 0.1133 | 0.1011 | 0.0220 | 0.0141 | | 7 | 0.0987 | 0.1658 | 0.0607 | -0.0102 | 0.0202 |
| 10 | 0.1526 | 0.1339 | 0.0733 | -0.0189 | 0.0167 | | 10 | 0.3694 | 0.1964 | 0.0500 | -0.0447 | 0.0245 |
| 20 | 0.5798 | 0.3028 | -0.0113 | -0.0792 | 0.0398 | | | | | | | |
| $M = 0.80$ | | | | | | | | | | | $M = 1.00$ | |
| -2 | -0.8555 | 0.1956 | 0.0784 | 0.0973 | 0.0223 | | -3 | -0.6997 | 0.2418 | 0.0238 | 0.0802 | 0.0280 |
| -1 | -0.4415 | 0.1711 | 0.0061 | 0.0837 | 0.0205 | | -2 | -0.6553 | 0.2204 | 0.0196 | 0.0751 | 0.0259 |
| 0 | -0.6347 | 0.1642 | 0.0834 | 0.0648 | 0.0198 | | -1 | -0.5776 | 0.2075 | 0.0099 | 0.0653 | 0.0247 |
| 1 | -0.5781 | 0.1558 | 0.0878 | 0.0680 | 0.0194 | | 0 | -0.4942 | 0.1957 | 0.0071 | 0.0566 | 0.0235 |
| 3 | -0.4650 | 0.1439 | 0.1084 | 0.0550 | 0.0178 | | 1 | -0.4165 | 0.1884 | 0.0039 | 0.0473 | 0.0231 |
| 5 | -0.3063 | 0.1292 | 0.1167 | 0.0359 | 0.0160 | | 2 | -0.3088 | 0.1850 | 0.0073 | 0.0358 | 0.0228 |
| 7 | -0.1104 | 0.1229 | 0.1194 | 0.0132 | 0.0152 | | 3 | -0.2255 | 0.1799 | 0.0157 | 0.0262 | 0.0220 |
| 10 | 0.2304 | 0.1460 | 0.0860 | -0.0285 | 0.0189 | | 5 | -0.0522 | 0.1726 | 0.0319 | 0.0069 | 0.0211 |
| 20 | 0.5864 | 0.3025 | -0.0062 | -0.0778 | 0.0384 | | 7 | 0.1833 | 0.1754 | 0.0346 | -0.0206 | 0.0214 |
| $M = 0.85$ | | | | | | | | | | | $M = 1.05$ | |
| -2 | -0.8421 | 0.2000 | 0.0711 | 0.0953 | 0.0235 | | -3 | -0.6877 | 0.2335 | 0.0225 | 0.0791 | 0.0274 |
| -1 | -0.7462 | 0.1895 | 0.0757 | 0.0847 | 0.0225 | | -2 | -0.6236 | 0.2146 | 0.0143 | 0.0718 | 0.0257 |
| 0 | -0.6504 | 0.1777 | 0.0894 | 0.0752 | 0.0213 | | -1 | -0.5574 | 0.2011 | 0.0133 | 0.0640 | 0.0242 |
| 1 | -0.5817 | 0.1771 | 0.0971 | 0.0678 | 0.0212 | | 0 | -0.4837 | 0.1892 | 0.0104 | 0.0557 | 0.0229 |
| 2 | -0.5182 | 0.1672 | 0.1026 | 0.0601 | 0.0202 | | 1 | -0.4111 | 0.1800 | 0.0064 | 0.0474 | 0.0222 |
| 3 | -0.4495 | 0.1541 | 0.1109 | 0.0528 | 0.0189 | | 2 | -0.3097 | 0.1768 | 0.0087 | 0.0360 | 0.0218 |
| 5 | -0.2682 | 0.1377 | 0.1236 | 0.0313 | 0.0169 | | 3 | -0.2189 | 0.1730 | 0.0151 | 0.0263 | 0.0212 |
| 7 | -0.0518 | 0.1312 | 0.1183 | 0.0067 | 0.0162 | | 5 | -0.0320 | 0.1660 | 0.0313 | 0.0044 | 0.0201 |
| 10 | 0.2448 | 0.1489 | 0.0908 | -0.0303 | 0.0193 | | 7 | 0.2029 | 0.1724 | 0.0265 | -0.0313 | 0.0211 |
| 20 | 0.5920 | 0.2951 | -0.0081 | -0.0790 | 0.0385 | | 10 | 0.4196 | 0.2011 | 0.0125 | -0.0513 | 0.0257 |
| $M = 0.90$ | | | | | | | | | | | $M = 1.10$ | |
| -2 | -0.7960 | 0.2108 | 0.0603 | 0.0901 | 0.0248 | | -3 | -0.6415 | 0.2200 | 0.0213 | 0.0750 | 0.0259 |
| -1 | -0.7029 | 0.1953 | 0.1269 | 0.0799 | 0.0233 | | -2 | -0.5836 | 0.2053 | 0.0159 | 0.0680 | 0.0244 |
| 0 | -0.6001 | 0.1860 | 0.0637 | 0.0689 | 0.0222 | | -1 | -0.5008 | 0.1880 | 0.0117 | 0.0577 | 0.0227 |
| 1 | -0.4935 | 0.1817 | 0.0609 | 0.0573 | 0.0223 | | 0 | -0.4449 | 0.1797 | 0.0099 | 0.0514 | 0.0219 |
| 2 | -0.4286 | 0.1426 | 0.0754 | 0.0501 | 0.0213 | | 1 | -0.3621 | 0.1723 | 0.0101 | 0.0420 | 0.0211 |
| 3 | -0.3429 | 0.1643 | 0.0811 | 0.0408 | 0.0202 | | 2 | -0.2587 | 0.1702 | 0.0110 | 0.0310 | 0.0209 |
| 5 | -0.1776 | 0.1519 | 0.0964 | 0.0216 | 0.0186 | | 3 | -0.1811 | 0.1645 | 0.0184 | 0.0223 | 0.0200 |
| 7 | 0.0490 | 0.1488 | 0.0970 | -0.0048 | 0.0181 | | 5 | 0.0310 | 0.1608 | 0.0308 | -0.0028 | 0.0194 |
| 10 | 0.3123 | 0.1693 | 0.0871 | -0.0378 | 0.0215 | | 7 | 0.2328 | 0.1713 | 0.0253 | -0.0272 | 0.0210 |
| 20 | 0.6319 | 0.3088 | -0.0118 | -0.0830 | 0.0396 | | 10 | 0.4428 | 0.2043 | 0.0071 | -0.0532 | 0.0259 |

~~CONFIDENTIAL~~

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(i) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.75$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|-------|-------|---------|-------|-------------------|---------|-------|---------|------------|-------|
| $M = 0.60$ | | | | | | | | | | $M = 0.95$ | |
| -3 | -0.7884 | .2016 | .0400 | .0928 | .0261 | -1 | -0.6581 | .2496 | .0358 | .0772 | .0315 |
| -2 | -0.7075 | .1924 | .0445 | .0842 | .0247 | 0 | -0.5311 | .2437 | .0321 | .0628 | .0308 |
| -1 | -0.6206 | .1873 | .0513 | .0750 | .0238 | 1 | -0.4445 | .2426 | .0351 | .0532 | .0306 |
| 0 | -0.5701 | .1842 | .0566 | .0695 | .0235 | 2 | -0.3925 | .2250 | .0664 | .0479 | .0287 |
| 1 | -0.5317 | .1811 | .0631 | .0639 | .0229 | 3 | -0.2886 | .2221 | .0556 | .0356 | .0281 |
| 2 | -0.4872 | .1791 | .0692 | .0593 | .0225 | 5 | -0.1559 | .2028 | .0919 | .0219 | .0258 |
| 3 | -0.4447 | .1740 | .0793 | .0538 | .0219 | 7 | .0496 | .2063 | .0857 | -0.0030 | .0258 |
| 5 | -0.3336 | .1648 | .0925 | .0400 | .0206 | 10 | .2540 | .2233 | .0789 | -0.0302 | .0287 |
| 7 | -0.2022 | .1545 | .1037 | .0246 | .0194 | 20 | .3925 | .3039 | .0678 | -0.0523 | .0368 |
| 10 | .0364 | .1668 | .1014 | -0.0037 | .0136 | | | | | | |
| 20 | .3032 | .2712 | .0645 | -0.0443 | .0344 | | | | | | |
| $M = 0.80$ | | | | | | | | | | $M = 1.00$ | |
| -3 | -0.7730 | .2158 | .0206 | .0898 | .0267 | -2 | -0.6955 | .2599 | .0242 | .0807 | .0323 |
| -2 | -0.6853 | .2047 | .0323 | .0804 | .0255 | -1 | -0.6182 | .2454 | .0244 | .0718 | .0347 |
| -1 | -0.6099 | .1978 | .0422 | .0725 | .0248 | 0 | -0.5078 | .2359 | .0199 | .0601 | .0299 |
| 0 | -0.5482 | .1936 | .0539 | .0656 | .0241 | 1 | -0.4195 | .2319 | .0299 | .0504 | .0296 |
| 1 | -0.4893 | .1887 | .0632 | .0590 | .0238 | 2 | -0.3511 | .2264 | .0399 | .0425 | .0288 |
| 2 | -0.4413 | .1839 | .0696 | .0533 | .0235 | 3 | -0.2650 | .2163 | .0467 | .0332 | .0274 |
| 3 | -0.3906 | .1804 | .0809 | .0479 | .0229 | 5 | -0.1104 | .2085 | .0644 | .0156 | .0265 |
| 5 | -0.2467 | .1672 | .0915 | .0304 | .0213 | 7 | .0994 | .2096 | .0617 | -0.0101 | .0265 |
| 7 | -0.0411 | .1645 | .0945 | .0069 | .0209 | 10 | .3643 | .2431 | .0467 | -0.0426 | .0314 |
| 10 | .1549 | .1839 | .0846 | -0.0192 | .0238 | 20 | .3754 | .2795 | .0715 | -0.0482 | .0344 |
| 20 | .3454 | .2783 | .0803 | -0.0479 | .0359 | | | | | | |
| $M = 0.85$ | | | | | | | | | | $M = 1.05$ | |
| -3 | -0.8316 | .2294 | .0389 | .0955 | .0280 | -2 | -0.6685 | .2508 | .0262 | .0787 | .0312 |
| -2 | -0.7003 | .2118 | .0346 | .0818 | .0263 | -1 | -0.5942 | .2363 | .0257 | .0707 | .0297 |
| -1 | -0.6205 | .2033 | .0408 | .0736 | .0256 | 0 | -0.4987 | .2256 | .0217 | .0602 | .0286 |
| 0 | -0.5497 | .1988 | .0521 | .0652 | .0251 | 1 | -0.3979 | .2218 | .0237 | .0489 | .0284 |
| 1 | -0.4956 | .1968 | .0618 | .0593 | .0252 | 2 | -0.3342 | .2186 | .0341 | .0421 | .0278 |
| 2 | -0.4377 | .1909 | .0735 | .0530 | .0243 | 3 | -0.2515 | .2079 | .0447 | .0319 | .0263 |
| 3 | -0.3733 | .1844 | .0865 | .0460 | .0236 | 5 | -0.0849 | .2009 | .0606 | .0126 | .0252 |
| 5 | -0.2317 | .1727 | .0989 | .0290 | .0221 | 7 | .1538 | .2057 | .0528 | -0.0155 | .0260 |
| 7 | -0.0129 | .1701 | .0963 | .0031 | .0216 | 10 | .3554 | .2363 | .0432 | -0.0410 | .0303 |
| 10 | .1802 | .1909 | .0852 | -0.0219 | .0246 | | | | | | |
| 20 | .3604 | .2867 | .0802 | -0.0503 | .0367 | | | | | | |
| $M = 0.90$ | | | | | | | | | | $M = 1.10$ | |
| -2 | -0.7912 | .2095 | .0592 | .0922 | .0299 | -2 | -0.6306 | .2407 | .0299 | .0751 | .0298 |
| -1 | -0.6939 | .2403 | .0665 | .0824 | .0299 | -1 | -0.5649 | .2272 | .0267 | .0668 | .0285 |
| 0 | -0.5904 | .2219 | .0727 | .0700 | .0281 | 0 | -0.4724 | .2184 | .0227 | .0567 | .0275 |
| 1 | -0.5295 | .2219 | .0865 | .0635 | .0283 | 1 | -0.3852 | .2158 | .1221 | .0468 | .0272 |
| 2 | -0.4686 | .2126 | .0975 | .0566 | .0270 | 2 | -0.3081 | .2111 | .1143 | .0390 | .0264 |
| 3 | -0.3920 | .2034 | .1081 | .0477 | .0259 | 3 | -0.2363 | .2028 | .1032 | .0306 | .0252 |
| 5 | -0.2313 | .1849 | .1193 | .0296 | .0236 | 5 | -0.0411 | .1976 | .0688 | .0083 | .0243 |
| 7 | -0.0122 | .1818 | .1075 | .0028 | .0229 | 7 | .1541 | .2028 | .0115 | -0.0151 | .0251 |
| 10 | .1765 | .1984 | .0953 | .0026 | .0255 | 10 | .3574 | .2340 | -0.0489 | -0.0404 | .0296 |
| 20 | .1643 | .3106 | .1275 | -0.0550 | .0384 | | | | | | |

~~CONFIDENTIAL~~

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(j) $x_s/c = 0.70$; $\delta_s = -0.075$; $\delta_d/\delta_s = 1.00$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|--------|---------|--------|-------------------|---------|--------|---------|---------|--------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.6211 | 0.2261 | 0.0247 | 0.0750 | 0.0282 | -2 | -0.6700 | 0.2817 | 0.0370 | 0.0791 | 0.0345 |
| -2 | -0.5561 | 0.2261 | 0.0313 | 0.0679 | 0.0284 | -1 | -0.5495 | 0.2788 | 0.0867 | 0.0659 | 0.0682 |
| -1 | -0.5115 | 0.2261 | 0.0426 | 0.0629 | 0.0281 | 0 | -0.4683 | 0.2670 | 0.0506 | 0.0571 | 0.0333 |
| 0 | -0.4749 | 0.2250 | 0.0494 | 0.0589 | 0.0281 | 1 | -0.4046 | 0.2670 | 0.0789 | 0.0500 | 0.0333 |
| 1 | -0.4384 | 0.2209 | 0.0541 | 0.0537 | 0.0278 | 2 | -0.3408 | 0.2494 | 0.0724 | 0.0430 | 0.0325 |
| 2 | -0.3958 | 0.2178 | 0.0629 | 0.0491 | 0.0273 | 3 | -0.2655 | 0.2465 | 0.0671 | 0.0342 | 0.0308 |
| 3 | -0.3471 | 0.2158 | 0.0737 | 0.0435 | 0.0266 | 5 | -0.0997 | 0.2406 | 0.0545 | 0.0166 | 0.0316 |
| 5 | -0.2212 | 0.2004 | 0.0819 | 0.0290 | 0.0248 | 7 | 0.0591 | 0.2289 | 0.0327 | -0.0037 | 0.0284 |
| 7 | -0.0995 | 0.1952 | 0.0926 | 0.0142 | 0.0242 | 10 | 0.2539 | 0.2465 | 0.0022 | -0.0294 | 0.0311 |
| 10 | 0.1340 | 0.2189 | 0.0818 | -0.0290 | 0.0269 | 20 | 0.4799 | 0.3404 | -0.0252 | -0.0626 | 0.0442 |
| 20 | 0.3511 | 0.3134 | 0.0837 | -0.0475 | 0.0393 | | | | | | |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.6318 | 0.2314 | 0.0067 | 0.0751 | 0.0292 | -2 | -0.6516 | 0.2918 | 0.0293 | 0.0765 | 0.0365 |
| -2 | -0.5630 | 0.2265 | 0.0195 | 0.0672 | 0.0284 | -1 | -0.5197 | 0.2816 | 0.0267 | 0.0630 | 0.0354 |
| -1 | -0.5052 | 0.2230 | 0.0299 | 0.0607 | 0.0282 | 0 | -0.4366 | 0.2782 | 0.0379 | 0.0529 | 0.0350 |
| 0 | -0.4419 | 0.2230 | 0.0431 | 0.0542 | 0.0278 | 1 | -0.3845 | 0.2748 | 0.0475 | 0.0470 | 0.0345 |
| 1 | -0.3978 | 0.2174 | 0.0465 | 0.0490 | 0.0278 | 2 | -0.3147 | 0.2692 | 0.0563 | 0.0394 | 0.0336 |
| 2 | -0.3497 | 0.2160 | 0.0578 | 0.0433 | 0.0273 | 3 | -0.2393 | 0.2580 | 0.0648 | 0.0310 | 0.0322 |
| 3 | -0.2946 | 0.2112 | 0.0668 | 0.0364 | 0.0267 | 5 | -0.0875 | 0.2490 | 0.0826 | 0.0133 | 0.0311 |
| 5 | -0.1500 | 0.1986 | 0.0774 | 0.0207 | 0.0253 | 7 | 0.1119 | 0.2524 | 0.0753 | -0.0103 | 0.0313 |
| 7 | 0.0151 | 0.1986 | 0.0826 | 0.0008 | 0.0249 | 10 | 0.3557 | 0.2838 | 0.0636 | -0.0408 | 0.0357 |
| 10 | 0.2147 | 0.2230 | 0.0702 | -0.0243 | 0.0285 | 20 | 0.4665 | 0.3276 | 0.0717 | -0.0600 | 0.0385 |
| 20 | 0.4488 | 0.3345 | 0.0678 | -0.0599 | 0.0426 | | | | | | |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -3 | -0.6570 | 0.2390 | 0.0061 | 0.0775 | 0.0295 | -2 | -0.6262 | 0.2792 | 0.0281 | 0.0737 | 0.0351 |
| -2 | -0.5807 | 0.2292 | 0.0151 | 0.0686 | 0.0288 | -1 | -0.5154 | 0.2696 | 0.0243 | 0.0622 | 0.0338 |
| -1 | -0.4966 | 0.2239 | 0.0292 | 0.0600 | 0.0280 | 0 | -0.4302 | 0.2684 | 0.0316 | 0.0526 | 0.0333 |
| 0 | -0.4384 | 0.2226 | 0.0409 | 0.0539 | 0.0280 | 1 | -0.3557 | 0.2642 | 0.0466 | 0.0444 | 0.0328 |
| 1 | -0.5432 | 0.2017 | 0.2561 | 0.0484 | 0.0280 | 2 | -0.2971 | 0.2598 | 0.0537 | 0.0371 | 0.0322 |
| 2 | -0.3350 | 0.2174 | 0.0565 | 0.0421 | 0.0274 | 3 | -0.2204 | 0.2490 | 0.0608 | 0.0287 | 0.0310 |
| 3 | -0.2703 | 0.2115 | 0.0665 | 0.0362 | 0.0266 | 5 | -0.0628 | 0.2426 | 0.0756 | 0.0108 | 0.0299 |
| 5 | -0.1345 | 0.2030 | 0.0816 | 0.0189 | 0.0254 | 7 | 0.1289 | 0.2448 | 0.0677 | -0.0123 | 0.0304 |
| 7 | 0.0440 | 0.2030 | 0.0788 | -0.0022 | 0.0254 | 10 | 0.3418 | 0.2750 | 0.0629 | -0.0398 | 0.0344 |
| 10 | 0.2380 | 0.2292 | 0.0671 | -0.0368 | 0.0292 | 20 | 0.4483 | 0.3180 | 0.0628 | -0.0584 | 0.0310 |
| 20 | 0.4772 | 0.3254 | 0.0677 | -0.0621 | 0.0436 | | | | | | |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -3 | -0.7189 | 0.2569 | 0.0171 | 0.0835 | 0.0322 | -2 | -0.6068 | 0.2706 | 0.0278 | 0.0717 | 0.0340 |
| -2 | -0.6064 | 0.2445 | 0.0185 | 0.0730 | 0.0304 | -1 | -0.4788 | 0.2602 | 0.0265 | 0.0582 | 0.0326 |
| -1 | -0.5123 | 0.2352 | 0.0289 | 0.0621 | 0.0295 | 0 | -0.4014 | 0.2570 | 0.0340 | 0.0493 | 0.0320 |
| 0 | -0.4511 | 0.2321 | 0.0444 | 0.0546 | 0.0290 | 1 | -0.3292 | 0.2538 | 0.0476 | 0.0406 | 0.0315 |
| 1 | -0.3986 | 0.2321 | 0.0507 | 0.0491 | 0.0293 | 2 | -0.2673 | 0.2476 | 0.0556 | 0.0336 | 0.0307 |
| 2 | -0.3350 | 0.2259 | 0.0595 | 0.0416 | 0.0283 | 3 | -0.1744 | 0.2404 | 0.0635 | 0.0238 | 0.0296 |
| 3 | -0.2543 | 0.2166 | 0.0675 | 0.0320 | 0.0271 | 5 | -0.0196 | 0.2372 | 0.0730 | 0.0053 | 0.0288 |
| 5 | -0.1271 | 0.2073 | 0.0836 | 0.0175 | 0.0260 | 7 | 0.1507 | 0.2404 | 0.0657 | -0.0158 | 0.0296 |
| 7 | 0.0562 | 0.2117 | 0.0806 | -0.0037 | 0.0262 | 10 | 0.3467 | 0.2686 | 0.0600 | -0.0397 | 0.0336 |
| 10 | 0.2518 | 0.2352 | 0.0670 | -0.0199 | 0.0297 | | | | | | |
| 20 | 0.4964 | 0.3528 | 0.0652 | -0.0643 | 0.0433 | | | | | | |

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(k) $x_s/c = 0.90$; $\delta_s = -0.075$; $\delta_d/\delta_s = 0.50$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|--------|---------|---------|--------|-------------------|---------|--------|--------|---------|--------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.8803 | 0.1805 | 0.1321 | 0.1035 | 0.0227 | -2 | -0.7666 | 0.2123 | 0.1641 | 0.0866 | 0.0271 |
| -2 | -0.7744 | 0.1630 | 0.1351 | 0.0911 | 0.0207 | -1 | -0.6757 | 0.1946 | 0.1599 | 0.0760 | 0.0254 |
| -1 | -0.6766 | 0.1527 | 0.1299 | 0.0809 | 0.0195 | 0 | -0.5534 | 0.1828 | 0.1553 | 0.0645 | 0.0240 |
| 0 | -0.6195 | 0.1465 | 0.1378 | 0.0740 | 0.0186 | 1 | -0.4544 | 0.1793 | 0.1503 | 0.0538 | 0.0236 |
| 1 | -0.5706 | 0.1444 | 0.1391 | 0.0685 | 0.0185 | 2 | -0.3379 | 0.1604 | 0.1498 | 0.0414 | 0.0211 |
| 2 | -0.5196 | 0.1393 | 0.1429 | 0.0617 | 0.0178 | 3 | -0.2214 | 0.1622 | 0.1526 | 0.0289 | 0.0211 |
| 3 | -0.4483 | 0.1341 | 0.1500 | 0.0536 | 0.0171 | 5 | 0.0117 | 0.1545 | 0.1501 | 0.0025 | 0.0200 |
| 5 | -0.2853 | 0.1228 | 0.1528 | 0.0338 | 0.0149 | 7 | 0.2621 | 0.1722 | 0.1155 | -0.0278 | 0.0226 |
| 7 | -0.1019 | 0.1186 | 0.1528 | 0.0136 | 0.0142 | 10 | 0.5243 | 0.2182 | 0.0732 | -0.0615 | 0.0296 |
| 10 | 0.1956 | 0.1527 | 0.1145 | -0.0235 | 0.0185 | | | | | | |
| 20 | 0.5258 | 0.3023 | 0.0274 | -0.0728 | 0.0315 | | | | | | |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.8984 | 0.1973 | 0.1245 | 0.1025 | 0.0236 | | | | | | |
| -2 | -0.7657 | 0.1749 | 0.1221 | 0.0880 | 0.0215 | | | | | | |
| -1 | -0.6703 | 0.1616 | 0.1276 | 0.0782 | 0.0202 | | | | | | |
| 0 | -0.5736 | 0.1539 | 0.1364 | 0.0677 | 0.0193 | | | | | | |
| 1 | -0.5211 | 0.1504 | 0.1393 | 0.0618 | 0.0192 | | | | | | |
| 2 | -0.4450 | 0.1420 | 0.1448 | 0.0534 | 0.0184 | | | | | | |
| 3 | -0.3524 | 0.1336 | 0.1482 | 0.0429 | 0.0171 | | | | | | |
| 5 | -0.1589 | 0.1259 | 0.1529 | 0.0204 | 0.0156 | | | | | | |
| 7 | 0.0968 | 0.1308 | 0.1371 | -0.0097 | 0.0162 | | | | | | |
| 10 | 0.4077 | 0.1679 | 0.0651 | -0.0492 | 0.0225 | | | | | | |
| 20 | 0.6772 | 0.3345 | -0.0110 | -0.0885 | 0.0428 | | | | | | |
| $M = 0.85$ | | | | | | | | | | | |
| -2 | -0.7794 | 0.1776 | 0.1326 | 0.0893 | 0.0220 | | | | | | |
| -1 | -0.6625 | 0.1631 | 0.1300 | 0.0768 | 0.0206 | | | | | | |
| 0 | -0.5715 | 0.1545 | 0.1382 | 0.0669 | 0.0198 | | | | | | |
| 1 | -0.4936 | 0.1473 | 0.1482 | 0.0581 | 0.0192 | | | | | | |
| 2 | -0.4027 | 0.1401 | 0.1528 | 0.0482 | 0.0182 | | | | | | |
| 3 | -0.2988 | 0.1302 | 0.1528 | 0.0363 | 0.0169 | | | | | | |
| 5 | -0.0935 | 0.1250 | 0.1587 | 0.0136 | 0.0159 | | | | | | |
| 7 | 0.1104 | 0.1328 | 0.1503 | -0.0111 | 0.0170 | | | | | | |
| 10 | 0.4650 | 0.1723 | 0.0793 | -0.0555 | 0.0238 | | | | | | |
| 20 | 0.7274 | 0.3354 | -0.0165 | -0.0940 | 0.0379 | | | | | | |
| $M = 0.90$ | | | | | | | | | | | |
| -2 | -0.4126 | 0.2051 | 0.0688 | 0.0000 | 0.0255 | | | | | | |
| -1 | -0.6877 | 0.1890 | 0.1572 | 0.0792 | 0.0244 | | | | | | |
| 0 | -0.5771 | 0.1815 | 0.1622 | 0.0681 | 0.0233 | | | | | | |
| 1 | -0.4850 | 0.1678 | 0.1651 | 0.0581 | 0.0218 | | | | | | |
| 2 | -0.3622 | 0.1504 | 0.1613 | 0.0437 | 0.0194 | | | | | | |
| 3 | -0.2640 | 0.1430 | 0.1670 | 0.0325 | 0.0184 | | | | | | |
| 5 | -0.0491 | 0.1399 | 0.1689 | 0.0082 | 0.0176 | | | | | | |
| 7 | 0.3929 | 0.1492 | -0.0058 | -0.0213 | 0.0190 | | | | | | |
| 10 | 1.0192 | 0.1865 | -0.1467 | -0.0599 | 0.0258 | | | | | | |
| $M = 0.95$ | | | | | | | | | | | |
| -2 | -0.7666 | 0.2123 | 0.1641 | 0.0866 | 0.0271 | | | | | | |
| -1 | -0.6757 | 0.1946 | 0.1599 | 0.0760 | 0.0254 | | | | | | |
| 0 | -0.5534 | 0.1828 | 0.1553 | 0.0645 | 0.0240 | | | | | | |
| 1 | -0.4544 | 0.1793 | 0.1503 | 0.0538 | 0.0236 | | | | | | |
| 2 | -0.3379 | 0.1604 | 0.1498 | 0.0414 | 0.0211 | | | | | | |
| 3 | -0.2214 | 0.1622 | 0.1526 | 0.0289 | 0.0211 | | | | | | |
| 5 | 0.0117 | 0.1545 | 0.1501 | 0.0025 | 0.0200 | | | | | | |
| 7 | 0.2621 | 0.1722 | 0.1155 | -0.0278 | 0.0226 | | | | | | |
| 10 | 0.5243 | 0.2182 | 0.0732 | -0.0615 | 0.0296 | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| -1 | -0.6459 | 0.1973 | 0.1562 | 0.0752 | 0.0253 | | | | | | |
| 0 | -0.5457 | 0.1832 | 0.1535 | 0.0633 | 0.0239 | | | | | | |
| 1 | -0.4399 | 0.1720 | 0.1513 | 0.0518 | 0.0225 | | | | | | |
| 2 | -0.3118 | 0.1624 | 0.1410 | 0.0379 | 0.0212 | | | | | | |
| 3 | -0.2005 | 0.1596 | 0.1461 | 0.0261 | 0.0208 | | | | | | |
| 5 | 0.0445 | 0.1590 | 0.1287 | -0.0107 | 0.0205 | | | | | | |
| 7 | 0.2784 | 0.1748 | 0.0969 | -0.0306 | 0.0229 | | | | | | |
| 10 | 0.5234 | 0.2182 | 0.0578 | -0.0621 | 0.0295 | | | | | | |
| $M = 1.05$ | | | | | | | | | | | |
| -1 | -0.6103 | 0.1881 | 0.1546 | 0.0715 | 0.0238 | | | | | | |
| 0 | -0.5139 | 0.1745 | 0.1567 | 0.0609 | 0.0222 | | | | | | |
| 1 | -0.4122 | 0.1604 | 0.1502 | 0.0495 | 0.0208 | | | | | | |
| 2 | -0.3105 | 0.1545 | 0.1497 | 0.0381 | 0.0200 | | | | | | |
| 3 | -0.1713 | 0.1523 | 0.1411 | 0.0234 | 0.0197 | | | | | | |
| 5 | 0.0889 | 0.1545 | 0.1123 | -0.0067 | 0.0198 | | | | | | |
| 7 | 0.2784 | 0.1707 | 0.0832 | -0.0311 | 0.0222 | | | | | | |
| 10 | 0.5086 | 0.2119 | 0.0483 | -0.0604 | 0.0280 | | | | | | |
| $M = 1.10$ | | | | | | | | | | | |
| -1 | -0.5808 | 0.1790 | 0.1547 | 0.0697 | 0.0230 | | | | | | |
| 0 | -0.4926 | 0.1680 | 0.1537 | 0.0590 | 0.0217 | | | | | | |
| 1 | -0.4097 | 0.1575 | 0.1481 | 0.0497 | 0.0204 | | | | | | |
| 2 | -0.2956 | 0.1486 | 0.1495 | 0.0372 | 0.0194 | | | | | | |
| 3 | -0.1607 | 0.1449 | 0.1397 | 0.0210 | 0.0189 | | | | | | |
| 5 | 0.1037 | 0.1496 | 0.1006 | -0.0080 | 0.0190 | | | | | | |
| 7 | 0.2800 | 0.1670 | 0.0757 | -0.0309 | 0.0176 | | | | | | |
| 10 | 0.4926 | 0.2074 | 0.0437 | -0.0577 | 0.0268 | | | | | | |

~~CONFIDENTIAL~~

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Continued

(I) $x_s/c = 0.90; \delta_s = -0.075; \delta_d/\delta_s = 0.75$

| α, deg | C_L | C_D | C_M | C_l | C_n | α, deg | C_L | C_D | C_M | C_l | C_n |
|----------------------|---------|-------|---------|---------|-------|----------------------|---------|-------|-------|---------|-------|
| $M = 0.60$ | | | | | | | | | | | |
| -3 | -0.7985 | .2146 | .1260 | .0949 | .0273 | -1 | -0.6408 | .2064 | .1301 | .0758 | .0284 |
| -2 | -0.7064 | .1980 | .1295 | .0844 | .0258 | 0 | -0.5709 | .2359 | .1596 | .0689 | .0320 |
| -1 | -0.6224 | .1866 | .1346 | .0756 | .0245 | 1 | -0.4718 | .2300 | .1641 | .0583 | .0308 |
| 0 | -0.5569 | .1835 | .1381 | .0685 | .0240 | 2 | -0.3786 | .2153 | .1644 | .0471 | .0291 |
| 1 | -0.5119 | .1804 | .1381 | .0629 | .0238 | 3 | -0.2679 | .2064 | .1717 | .0347 | .0278 |
| 2 | -0.4402 | .1741 | .1429 | .0551 | .0229 | 5 | -0.0559 | .1887 | .1630 | .0112 | .0254 |
| 3 | -0.3685 | .1690 | .1528 | .0464 | .0221 | 7 | 0.2015 | .2064 | .1294 | -0.0197 | .0273 |
| 5 | -0.2129 | .1565 | .1498 | .0283 | .0206 | 10 | 0.4777 | .2359 | .0905 | -0.0553 | .0324 |
| 7 | -0.0307 | .1555 | .1461 | .0078 | .0205 | | | | | | |
| 10 | .3276 | .1970 | .0796 | -0.0377 | .0253 | | | | | | |
| 20 | .6450 | .3524 | -0.0098 | -0.0856 | .0465 | | | | | | |
| $M = 0.80$ | | | | | | | | | | | |
| -3 | -0.8135 | .2144 | .1147 | .0945 | .0268 | -1 | -0.6724 | .2407 | .1698 | .0780 | .0302 |
| -2 | -0.7080 | .1996 | .1184 | .0834 | .0254 | 0 | -0.5722 | .2266 | .1633 | .0675 | .0290 |
| -1 | -0.6108 | .1898 | .1283 | .0732 | .0244 | 1 | -0.4598 | .2170 | .1582 | .0557 | .0280 |
| 0 | -0.5275 | .1827 | .1346 | .0637 | .0237 | 2 | -0.3473 | .2035 | .1582 | .0428 | .0261 |
| 1 | -0.4650 | .1785 | .1368 | .0568 | .0231 | 3 | -0.2538 | .2001 | .1676 | .0327 | .0257 |
| 2 | -0.3818 | .1708 | .1401 | .0473 | .0224 | 5 | -0.0334 | .1961 | .1591 | .0081 | .0249 |
| 3 | -0.2846 | .1630 | .1447 | .0361 | .0212 | 7 | 0.1859 | .2085 | .1275 | -0.0183 | .0265 |
| 5 | -0.1027 | .1546 | .1465 | .0167 | .0205 | 10 | 0.4264 | .2525 | .0976 | -0.0491 | .0327 |
| 7 | .1249 | .1616 | .1272 | -0.0110 | .0211 | | | | | | |
| 10 | .4165 | .2010 | .0565 | -0.0485 | .0271 | | | | | | |
| 20 | .3595 | .1827 | .0773 | -0.0920 | .0458 | | | | | | |
| $M = 0.85$ | | | | | | | | | | | |
| -3 | -0.9306 | .2059 | .2751 | .0575 | .0267 | -1 | -0.6634 | .2297 | .1758 | .0781 | .0303 |
| -2 | -0.7820 | .2243 | .1372 | .0913 | .0286 | 0 | -0.5714 | .2167 | .1713 | .0680 | .0291 |
| -1 | -0.6595 | .2145 | .1385 | .0783 | .0274 | 1 | -0.4579 | .2075 | .1606 | .0560 | .0280 |
| 0 | -0.5474 | .2046 | .1478 | .0664 | .0263 | 2 | -0.3402 | .1972 | .1575 | .0431 | .0265 |
| 1 | -0.3715 | .1927 | .1577 | .0468 | .0250 | 3 | -0.2429 | .1939 | .1649 | .0325 | .0261 |
| 2 | -0.2502 | .1848 | .1648 | .0331 | .0240 | 5 | 0.0075 | .1912 | .1447 | .0041 | .0251 |
| 3 | -0.0326 | .1795 | .1662 | .0093 | .0234 | 7 | 0.2119 | .2069 | .1159 | -0.0215 | .0272 |
| 5 | .2411 | .2013 | .1339 | -0.0242 | .0258 | 10 | 0.4248 | .2475 | .0882 | -0.0491 | .0328 |
| 7 | .5122 | .2375 | .0961 | -0.0594 | .0318 | | | | | | |
| $M = 0.90$ | | | | | | | | | | | |
| -2 | -0.7521 | .2153 | .1339 | .0872 | .0272 | -1 | -0.6449 | .2215 | .1752 | .0764 | .0293 |
| -1 | -0.6288 | .2054 | .1322 | .0740 | .0262 | 0 | -0.5412 | .2089 | .1686 | .0648 | .0280 |
| 0 | -0.5252 | .1960 | .1375 | .0628 | .0254 | 1 | -0.4354 | .2000 | .1624 | .0537 | .0267 |
| 1 | -0.4389 | .1929 | .1461 | .0536 | .0249 | 2 | -0.3183 | .1921 | .1575 | .0407 | .0257 |
| 2 | -0.3329 | .1779 | .1454 | .0420 | .0232 | 3 | -0.2073 | .1890 | .1609 | .0288 | .0252 |
| 3 | -0.2355 | .1716 | .1501 | .0309 | .0224 | 5 | 0.0311 | .1884 | .1355 | .0008 | .0248 |
| 5 | -0.0308 | .1685 | .1550 | .0084 | .0218 | 7 | 0.2229 | .2036 | .1078 | -0.0229 | .0268 |
| 7 | .2158 | .1841 | .1340 | -0.0216 | .0238 | 10 | 0.4354 | .2467 | .0793 | -0.0503 | .0324 |
| 10 | .4993 | .2278 | .0900 | -0.0577 | .0303 | | | | | | |
| $M = 0.95$ | | | | | | | | | | | |
| -1 | -0.6408 | .2064 | .1301 | .0758 | .0284 | | | | | | |
| 0 | -0.5709 | .2359 | .1596 | .0689 | .0320 | | | | | | |
| 1 | -0.4718 | .2300 | .1641 | .0583 | .0308 | | | | | | |
| 2 | -0.3786 | .2153 | .1644 | .0471 | .0291 | | | | | | |
| 3 | -0.2679 | .2064 | .1717 | .0347 | .0278 | | | | | | |
| 5 | -0.0559 | .1887 | .1630 | .0112 | .0254 | | | | | | |
| 7 | 0.2015 | .2064 | .1294 | -0.0197 | .0273 | | | | | | |
| 10 | 0.4777 | .2359 | .0905 | -0.0553 | .0324 | | | | | | |
| $M = 1.00$ | | | | | | | | | | | |
| -1 | -0.6724 | .2407 | .1698 | .0780 | .0302 | | | | | | |
| 0 | -0.5722 | .2266 | .1633 | .0675 | .0290 | | | | | | |
| 1 | -0.4598 | .2170 | .1582 | .0557 | .0280 | | | | | | |
| 2 | -0.3473 | .2035 | .1582 | .0428 | .0261 | | | | | | |
| 3 | -0.2538 | .2001 | .1676 | .0327 | .0257 | | | | | | |
| 5 | -0.0334 | .1961 | .1591 | .0081 | .0249 | | | | | | |
| 7 | 0.1859 | .2085 | .1275 | -0.0183 | .0265 | | | | | | |
| 10 | 0.4264 | .2525 | .0976 | -0.0491 | .0327 | | | | | | |
| $M = 1.05$ | | | | | | | | | | | |
| -1 | -0.6634 | .2297 | .1758 | .0781 | .0303 | | | | | | |
| 0 | -0.5714 | .2167 | .1713 | .0680 | .0291 | | | | | | |
| 1 | -0.4579 | .2075 | .1606 | .0560 | .0280 | | | | | | |
| 2 | -0.3402 | .1972 | .1575 | .0431 | .0265 | | | | | | |
| 3 | -0.2429 | .1939 | .1649 | .0325 | .0261 | | | | | | |
| 5 | 0.0075 | .1912 | .1447 | .0041 | .0251 | | | | | | |
| 7 | 0.2119 | .2069 | .1159 | -0.0215 | .0272 | | | | | | |
| 10 | 0.4248 | .2475 | .0882 | -0.0491 | .0328 | | | | | | |
| $M = 1.10$ | | | | | | | | | | | |
| -1 | -0.6449 | .2215 | .1752 | .0764 | .0293 | | | | | | |
| 0 | -0.5412 | .2089 | .1686 | .0648 | .0280 | | | | | | |
| 1 | -0.4354 | .2000 | .1624 | .0537 | .0267 | | | | | | |
| 2 | -0.3183 | .1921 | .1575 | .0407 | .0257 | | | | | | |
| 3 | -0.2073 | .1890 | .1609 | .0288 | .0252 | | | | | | |
| 5 | 0.0311 | .1884 | .1355 | .0008 | .0248 | | | | | | |
| 7 | 0.2229 | .2036 | .1078 | -0.0229 | .0268 | | | | | | |
| 10 | 0.4354 | .2467 | .0793 | -0.0503 | .0324 | | | | | | |

~~CONFIDENTIAL~~

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING - Concluded

(m) $x_s/c = 0.90; \delta_s = -0.075; \delta_d/\delta_s = 1.00$

| α , deg | C_L | C_D | C_M | C_l | C_n | α , deg | C_L | C_D | C_M | C_l | C_n |
|-------------------|---------|-------|---------|---------|-------|-------------------|---------|-------|-------|---------|-------|
| $M = 0.60$ | | | | | | $M = 0.95$ | | | | | |
| -3 | -0.7198 | .2395 | .1012 | .0853 | .0318 | -2 | -0.6874 | .2772 | .1252 | .0793 | .0349 |
| -2 | -0.6322 | .2271 | .1058 | .0753 | .0289 | -1 | -0.5534 | .2625 | .1215 | .0657 | .0336 |
| -1 | -0.5587 | .2220 | .1133 | .0676 | .0295 | 0 | -0.4544 | .2566 | .1299 | .0554 | .0332 |
| 0 | -0.4955 | .2168 | .1153 | .0608 | .0292 | 1 | -0.3786 | .2507 | .1326 | .0466 | .0311 |
| 1 | -0.4425 | .2147 | .1183 | .0539 | .0283 | 2 | -0.2621 | .2389 | .1302 | .0337 | .0303 |
| 2 | -0.3772 | .2065 | .1203 | .0465 | .0275 | 3 | -0.1689 | .2271 | .1370 | .0236 | .0299 |
| 3 | -0.3059 | .2013 | .1223 | .0384 | .0267 | 5 | .0384 | .2182 | .1329 | .0000 | .0274 |
| 5 | -0.1529 | .1941 | .1280 | .0202 | .0256 | 7 | .2621 | .2418 | .1049 | -0.0275 | .0311 |
| 7 | .0265 | .2013 | .1253 | -0.0006 | .0260 | 10 | .5126 | .2831 | .0733 | -0.0606 | .0367 |
| 10 | .3405 | .2416 | .0597 | -0.0403 | .0307 | | | | | | |
| 20 | .6831 | .4057 | -0.0309 | -0.0899 | .0523 | | | | | | |
| $M = 0.80$ | | | | | | $M = 1.00$ | | | | | |
| -3 | -0.6943 | .2311 | .0823 | .0837 | .0295 | -2 | -0.6905 | .2853 | .1376 | .0801 | .0357 |
| -2 | -0.6224 | .2192 | .0936 | .0732 | .0285 | -1 | -0.5513 | .2706 | .1240 | .0657 | .0346 |
| -1 | -0.5256 | .2101 | .1033 | .0631 | .0275 | 0 | -0.4455 | .2622 | .1254 | .0542 | .0338 |
| 0 | -0.4495 | .2045 | .1066 | .0536 | .0272 | 1 | -0.3564 | .2582 | .1301 | .0454 | .0327 |
| 1 | -0.3969 | .2038 | .1118 | .0475 | .0270 | 2 | -0.2561 | .2458 | .1320 | .0327 | .0312 |
| 2 | -0.3153 | .1989 | .1177 | .0381 | .0262 | 3 | -0.1559 | .2447 | .1432 | .0225 | .0308 |
| 3 | -0.2075 | .1898 | .1158 | .0267 | .0251 | 5 | .0724 | .2424 | .1262 | -0.0034 | .0307 |
| 5 | -0.0553 | .1869 | .1238 | .0090 | .0245 | 7 | .2895 | .2605 | .0966 | -0.0300 | .0336 |
| 7 | .1632 | .2003 | .1043 | -0.0166 | .0261 | 10 | .5234 | .3112 | .0663 | -0.0604 | .0403 |
| 10 | .4163 | .2451 | .0455 | -0.0503 | .0323 | | | | | | |
| 20 | .7220 | .4089 | -0.0363 | -0.0936 | .0528 | | | | | | |
| $M = 0.85$ | | | | | | $M = 1.05$ | | | | | |
| -2 | -0.6300 | .2236 | .0922 | .0741 | .0290 | -2 | -0.6743 | .2753 | .1455 | .0786 | .0342 |
| -1 | -0.5326 | .2170 | .1031 | .0638 | .0283 | -1 | -0.5673 | .2617 | .1264 | .0669 | .0334 |
| 0 | -0.4611 | .2104 | .1080 | .0545 | .0279 | 0 | -0.4388 | .2536 | .1208 | .0539 | .0322 |
| 1 | -0.3962 | .2104 | .1144 | .0470 | .0277 | 1 | -0.3372 | .2476 | .1281 | .0433 | .0313 |
| 2 | -0.2949 | .2019 | .1199 | .0361 | .0264 | 2 | -0.2408 | .2357 | .1285 | .0316 | .0300 |
| 3 | -0.2078 | .1953 | .1191 | .0259 | .0256 | 3 | -0.1359 | .2335 | .1347 | .0200 | .0297 |
| 5 | -0.0195 | .1920 | .1271 | .0051 | .0251 | 5 | .0963 | .2373 | .1130 | -0.0068 | .0298 |
| 7 | .1884 | .2071 | .1021 | -0.0197 | .0269 | 7 | .3050 | .2574 | .0865 | -0.0324 | .0328 |
| 10 | .4416 | .2499 | .0458 | -0.0527 | .0331 | 10 | .5084 | .3045 | .0586 | -0.0592 | .0390 |
| 20 | .7404 | .4169 | -0.0406 | -0.0958 | .0534 | | | | | | |
| $M = 0.90$ | | | | | | $M = 1.10$ | | | | | |
| -2 | -0.6439 | .2345 | .0959 | .0753 | .0304 | -2 | -0.6534 | .2609 | .1409 | .0777 | .0332 |
| -1 | -0.5406 | .2239 | .1035 | .0643 | .0290 | -1 | -0.5393 | .2468 | .1301 | .0646 | .0318 |
| 0 | -0.4485 | .2190 | .1138 | .0532 | .0286 | 0 | -0.3962 | .2389 | .1194 | .0495 | .0307 |
| 1 | -0.3748 | .2177 | .1203 | .0454 | .0285 | 1 | -0.2852 | .2310 | .1211 | .0427 | .0293 |
| 2 | -0.2728 | .2053 | .1197 | .0333 | .0270 | 2 | -0.1919 | .2273 | .1300 | .0265 | .0288 |
| 3 | -0.1782 | .2003 | .1227 | .0230 | .0261 | 3 | -0.0830 | .2258 | .1294 | .0140 | .0284 |
| 5 | .0184 | .2003 | .1302 | .0007 | .0261 | 5 | .1452 | .2326 | .1008 | -0.0125 | .0292 |
| 7 | .2371 | .2196 | .0977 | -0.0254 | .0284 | 7 | .3059 | .2520 | .0788 | -0.0328 | .0318 |
| 10 | .4854 | .2613 | .0513 | -0.0587 | .0346 | 10 | .5030 | .2609 | .0552 | -0.0585 | .0189 |

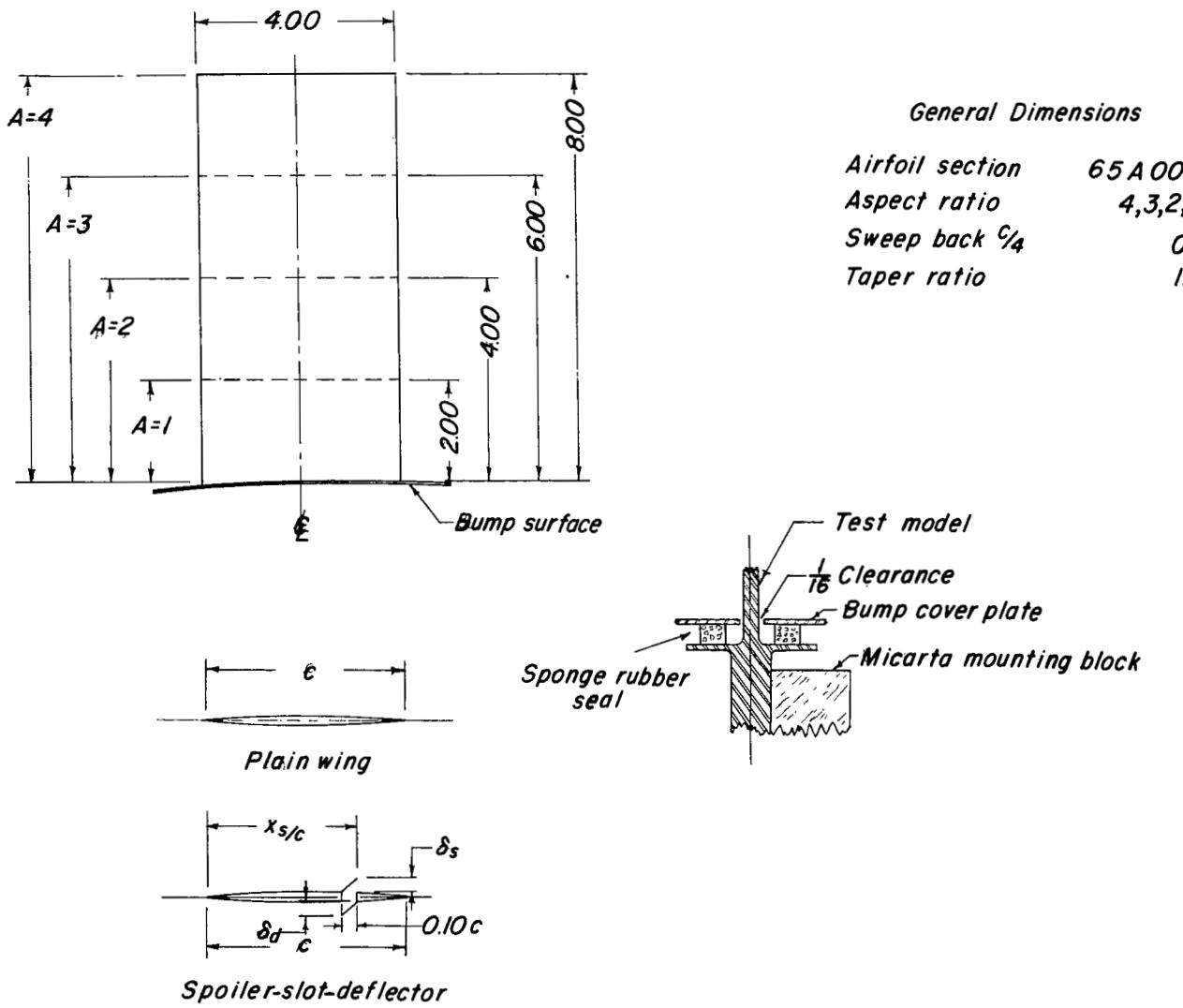


Figure 1.- Geometric characteristics of models used in investigation. All dimensions in inches unless otherwise noted.

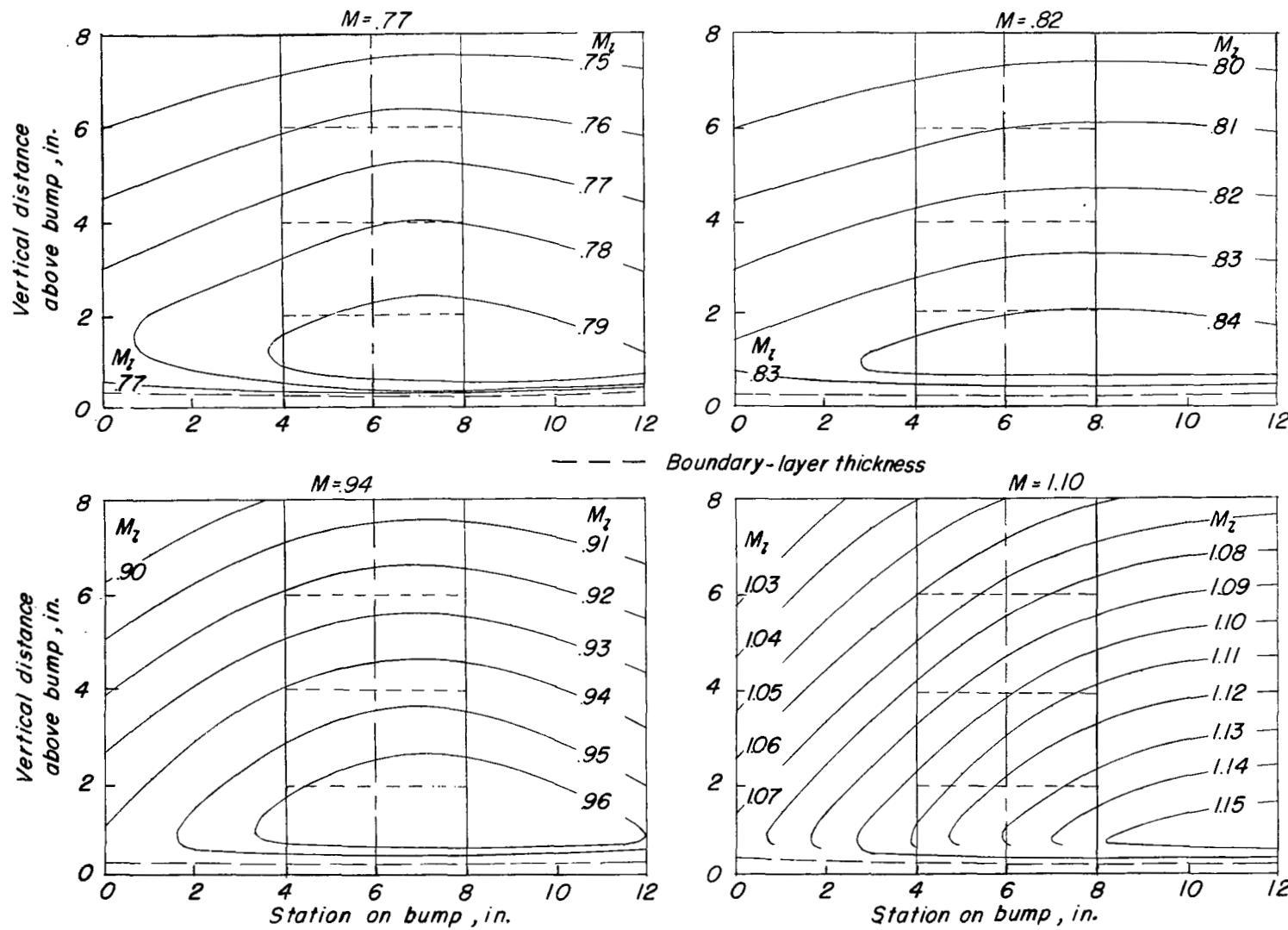


Figure 2.- Typical Mach number contours over transonic bump in region of model location.

REFLECTION-PLANE CORRECTION

IN TERMS OF SYMMETRIC C_L

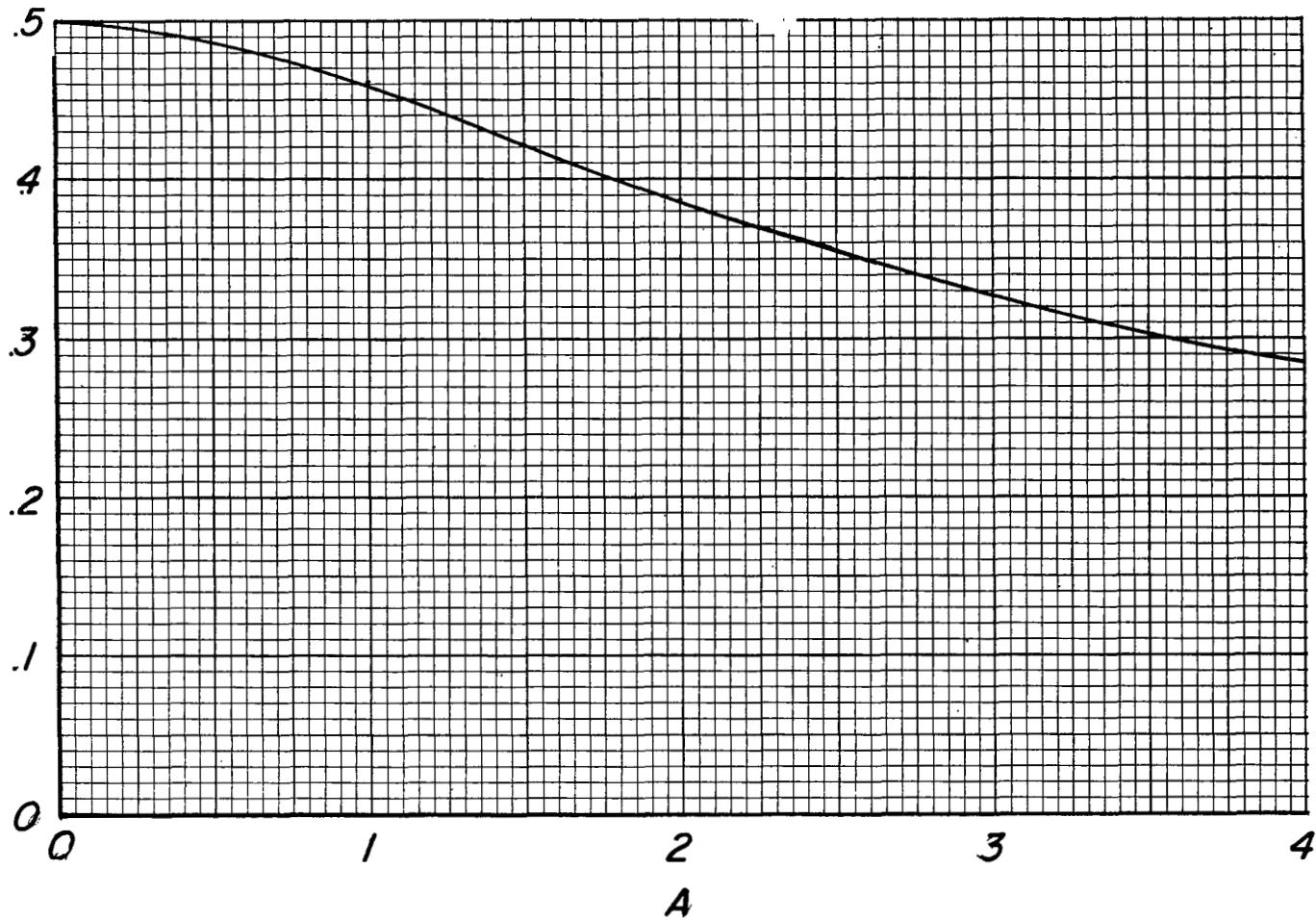


Figure 3.- Variation of reflection-plane correction with aspect ratio for full-span controls on untapered unswept wings.

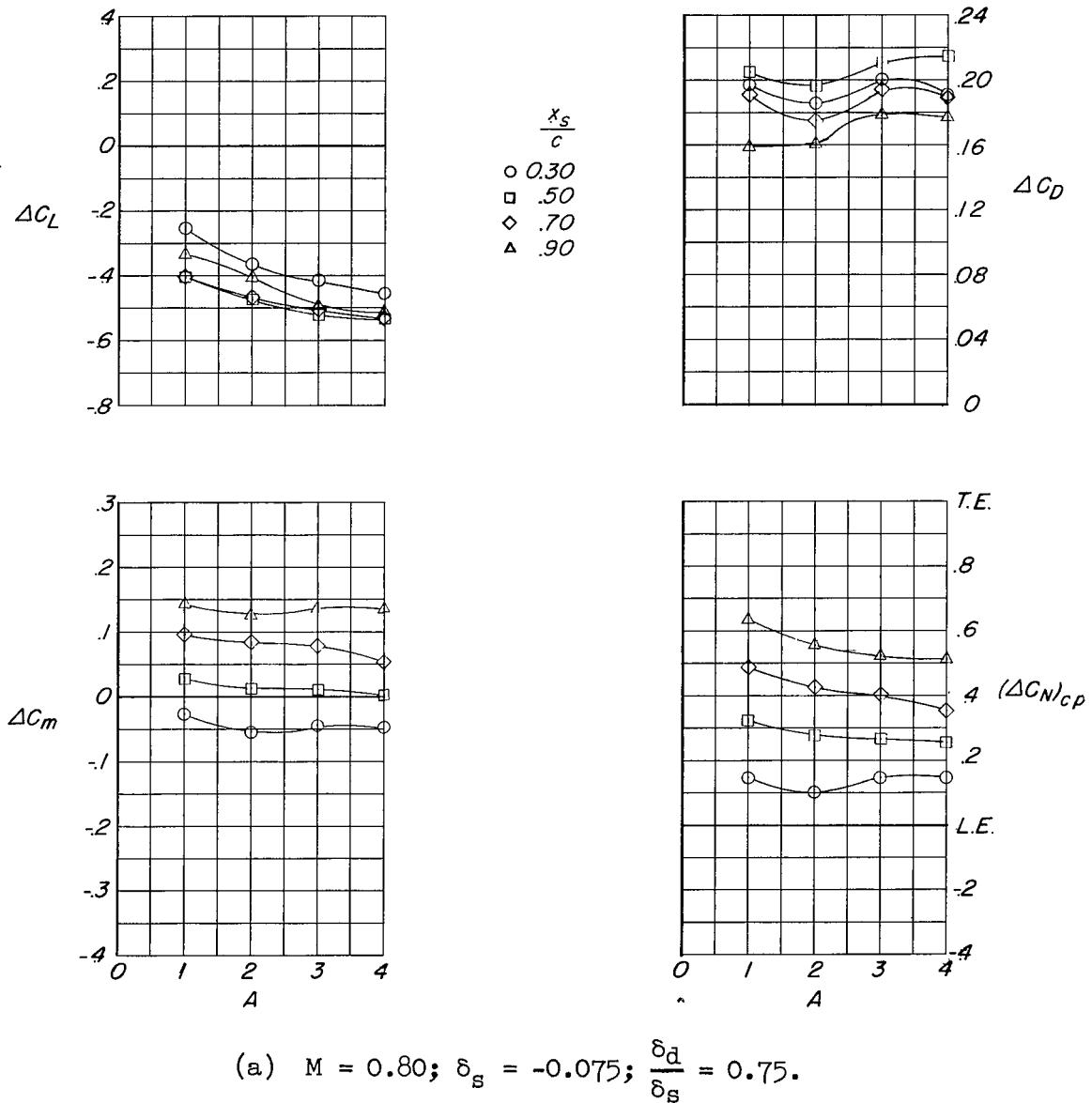
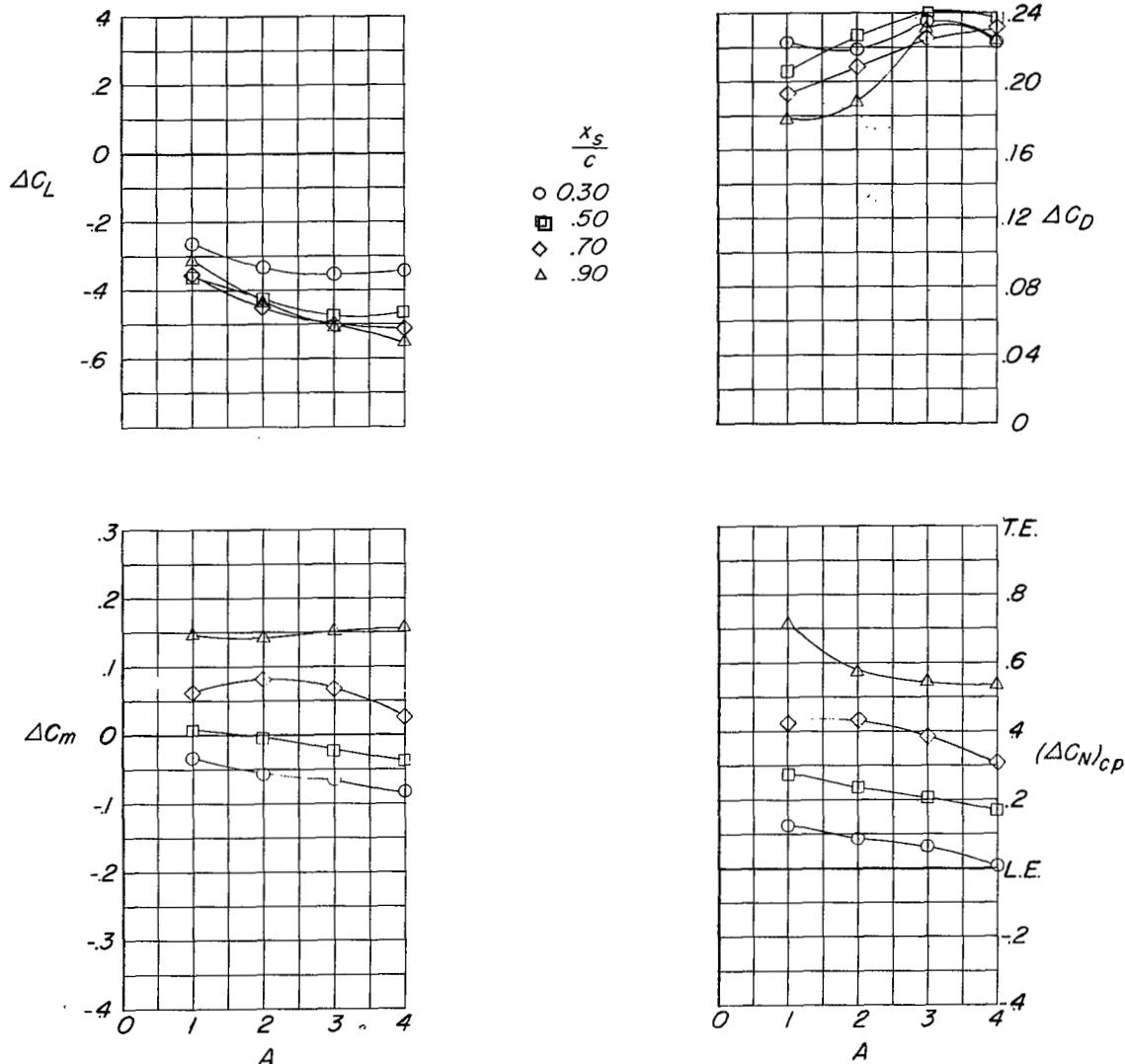


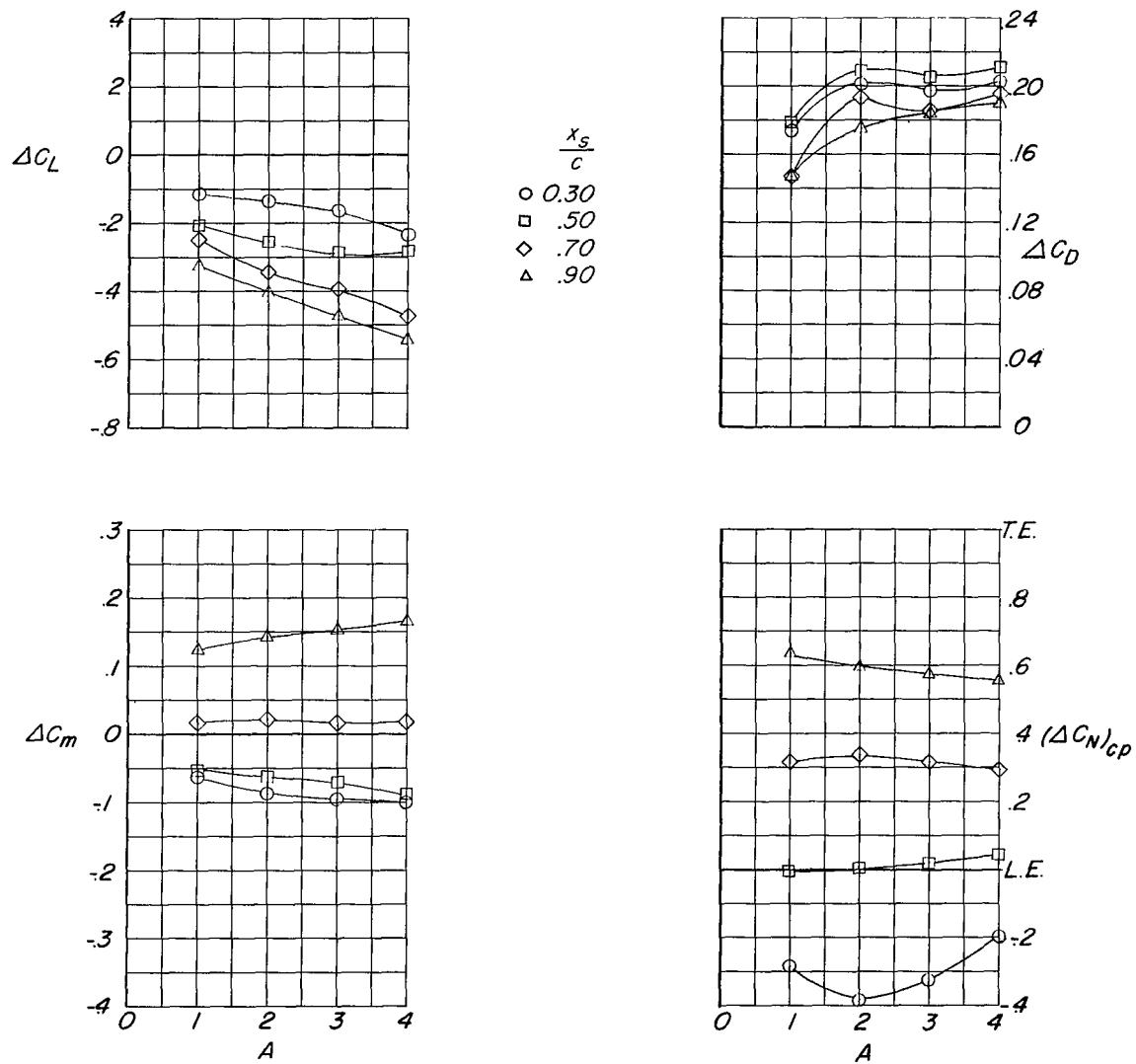
Figure 4.- Variation of the incremental lift, drag, and pitching-moment coefficients and center of pressure with aspect ratio at an angle of attack of 0° for various chordwise positions of the spoiler-slot-deflector configuration.



$$(b) \quad M = 0.95; \quad \delta_s = -0.075; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- Continued.

~~CONFIDENTIAL~~



$$(c) \quad M = 1.10; \quad \delta_s = -0.075; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- Concluded.

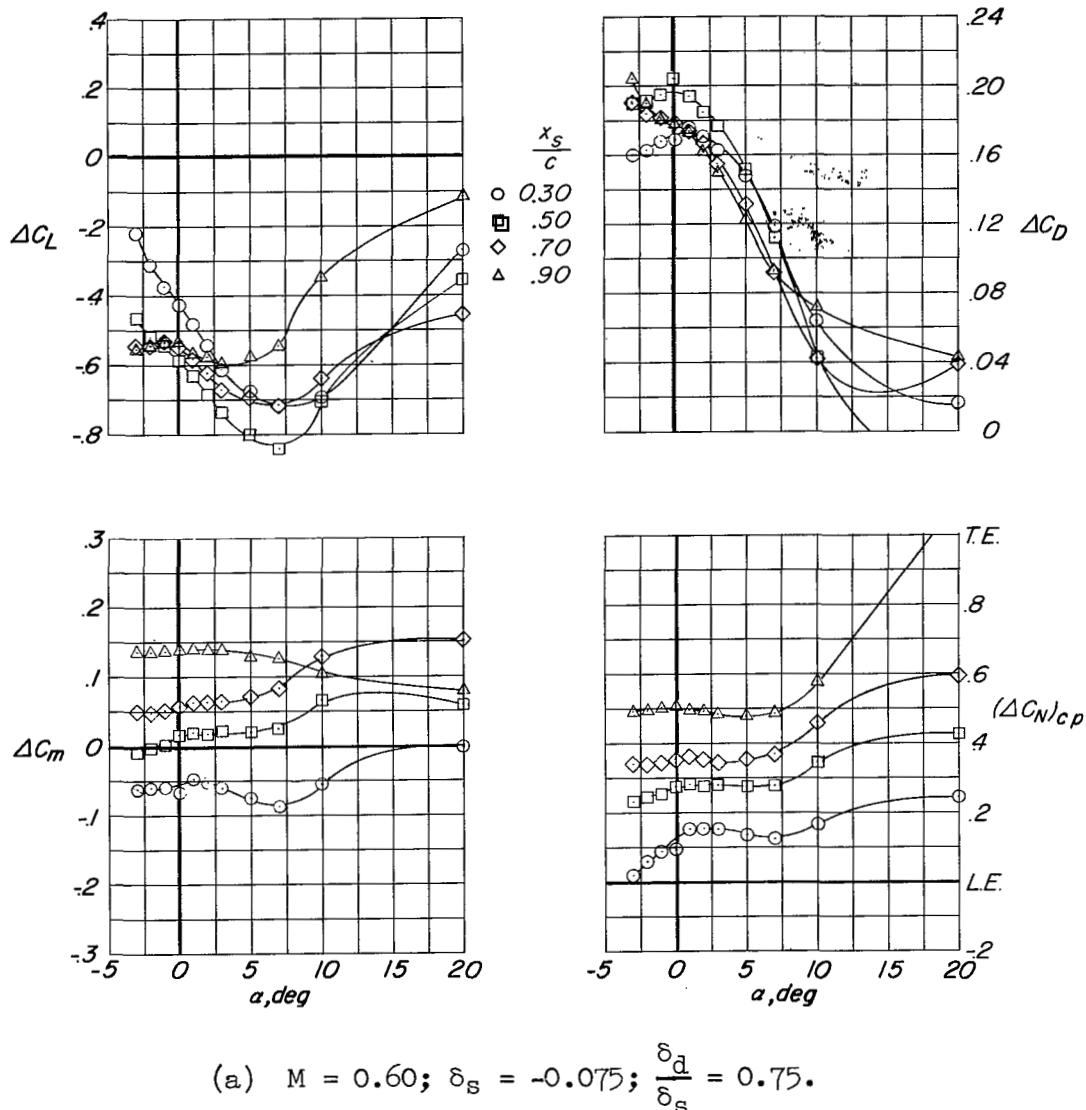
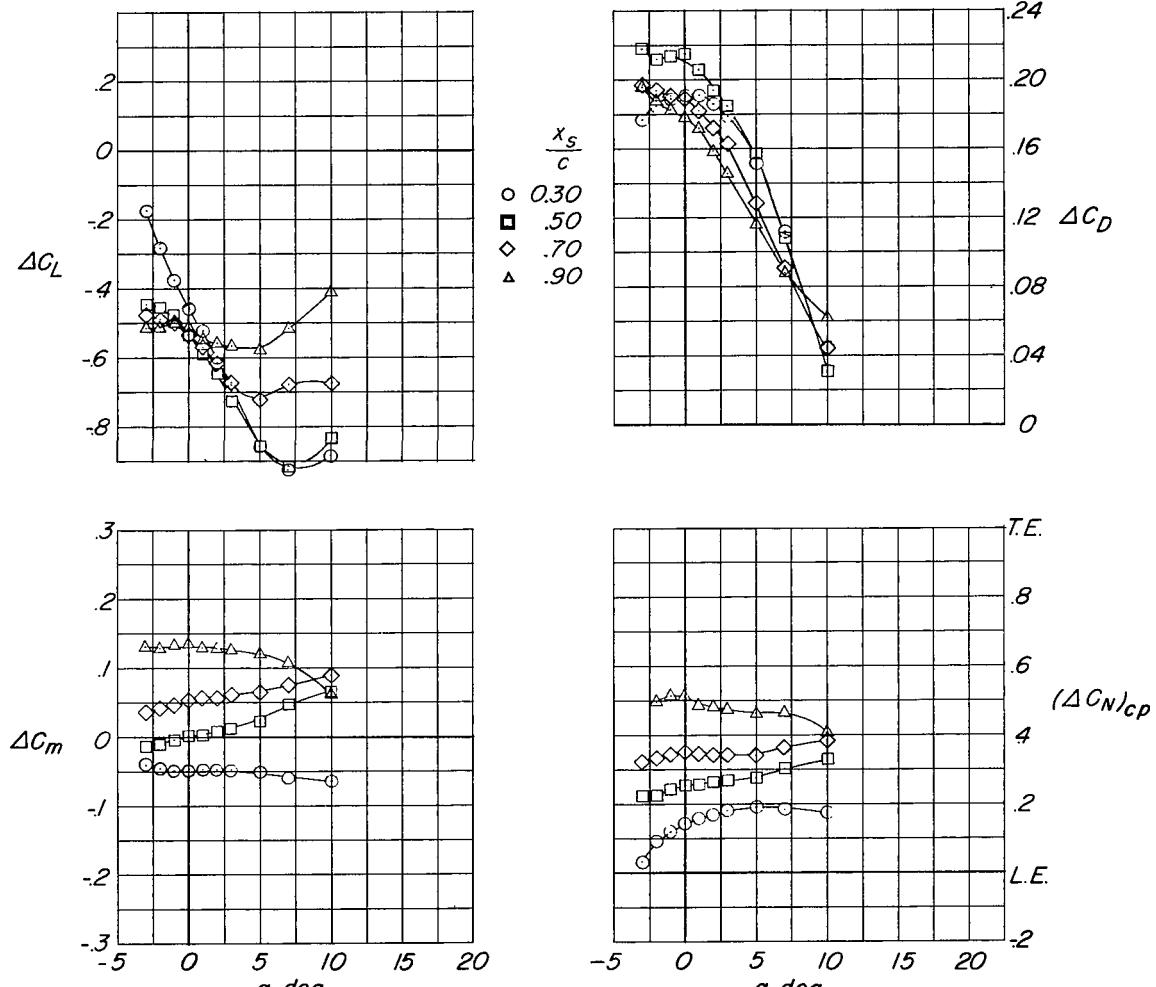
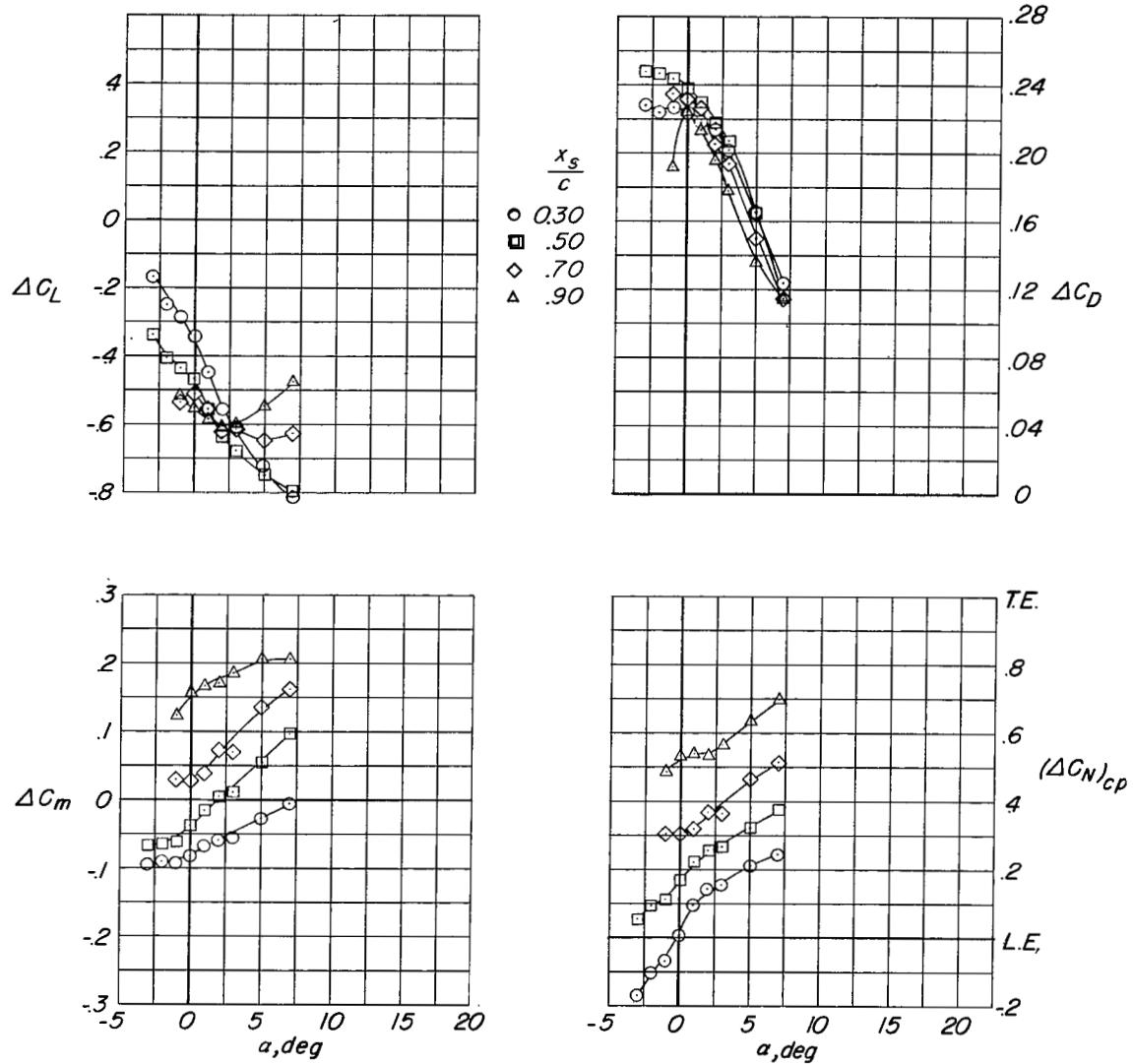


Figure 5.- Variation of the incremental lift, drag, and pitching-moment coefficients and center of pressure with angle of attack for the aspect-ratio-4 model for various chordwise positions of the spoiler-slot-deflector configuration.



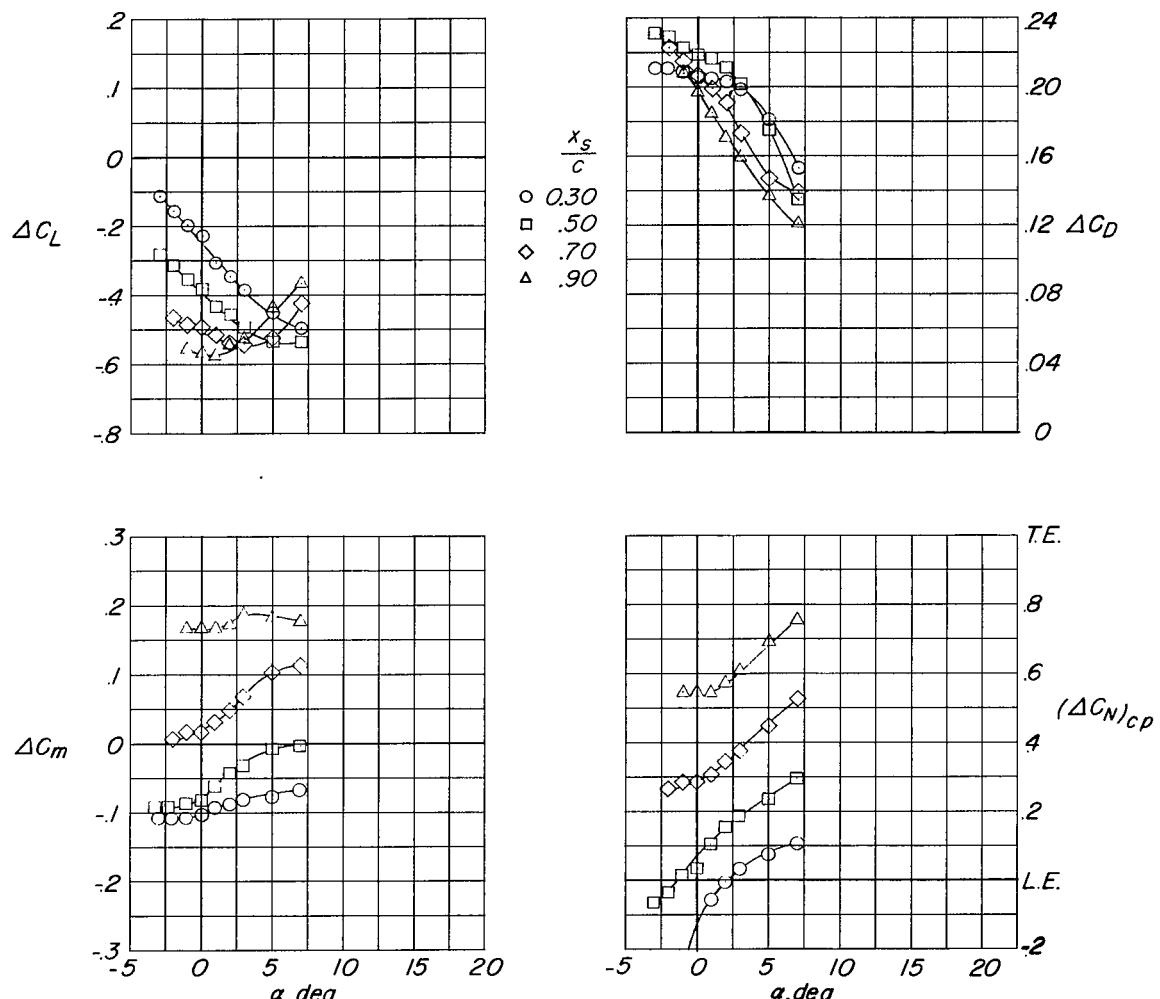
$$(b) \quad M = 0.80; \quad \delta_s = -0.075; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 5.- Continued.



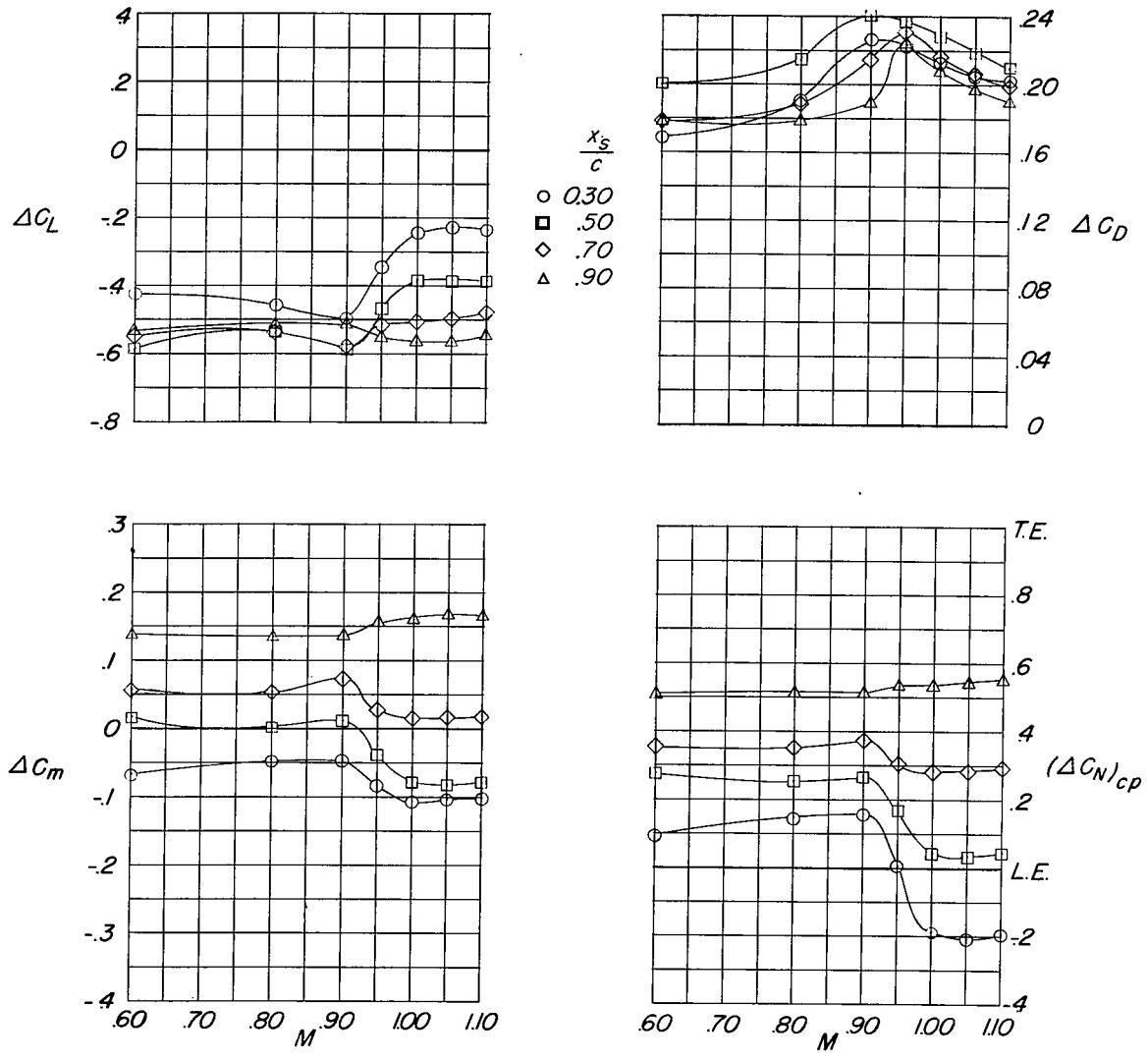
$$(c) \quad M = 0.95; \quad \delta_s = -0.075; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 5.- Continued.



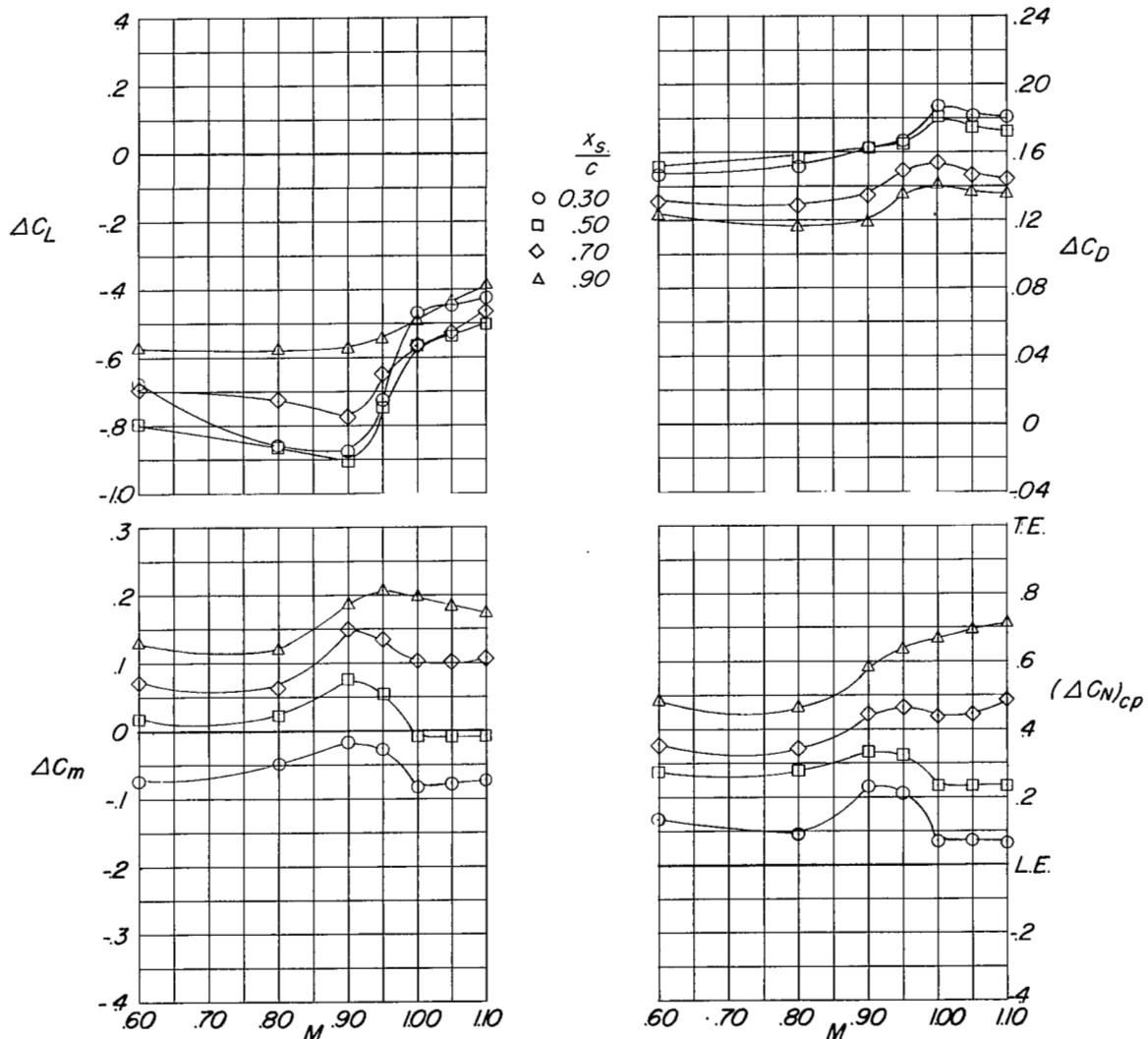
(d) $M = 1.05$; $\delta_s = -0.075$; $\frac{\delta_d}{\delta_s} = 0.75$.

Figure 5.- Concluded.



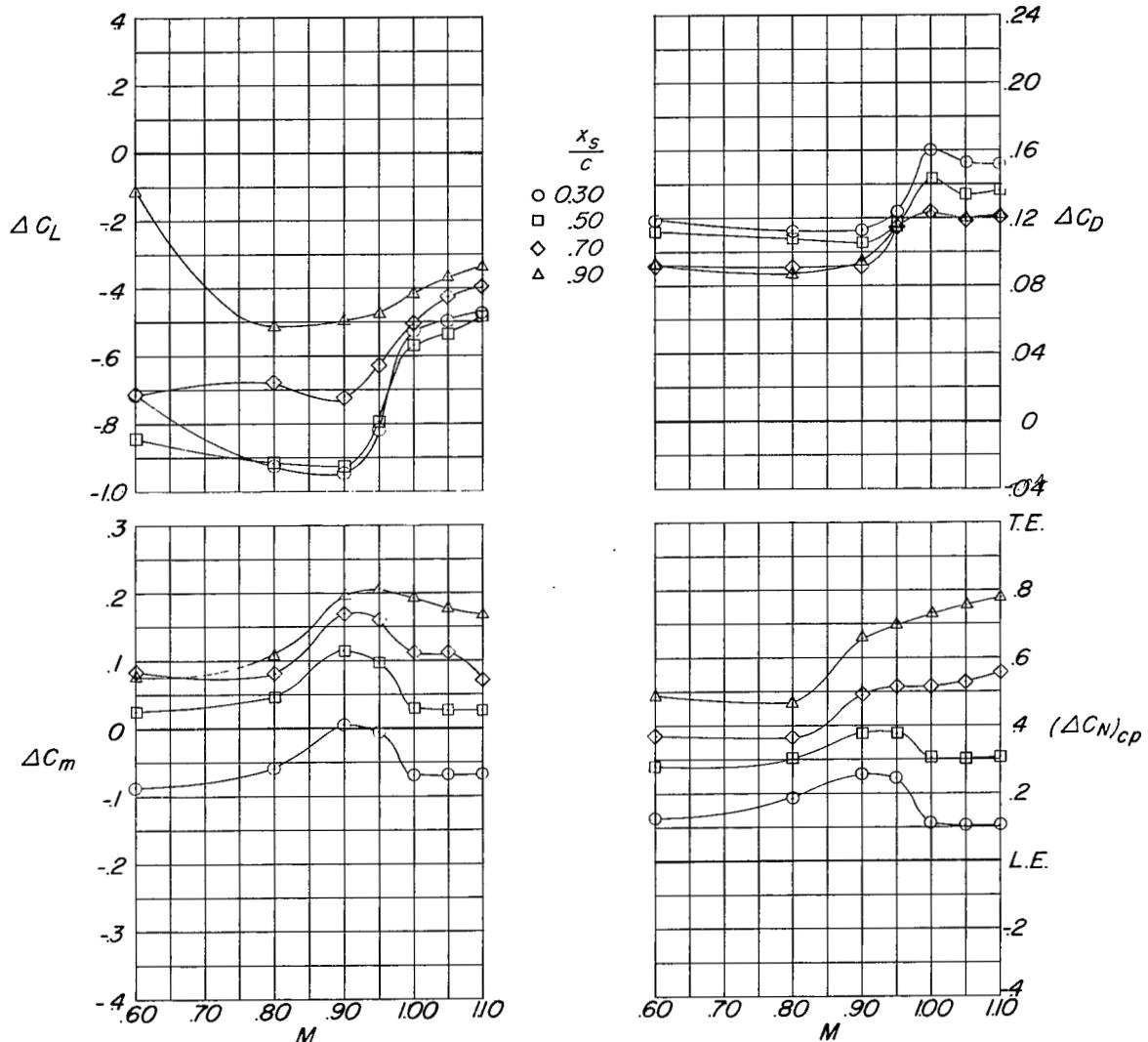
$$(a) \quad \alpha = 0^\circ; \delta_s = -0.075; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- Variation of the incremental lift, drag, and pitching-moment coefficients and center of pressure with Mach number for the aspect-ratio-4 model for various chordwise positions of the spoiler-slot-deflector configuration.



$$(b) \quad \alpha = 5^\circ; \delta_s = -0.075; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- Continued.



$$(c) \quad \alpha = 7^\circ; \quad \delta_s = -0.075; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- Concluded.

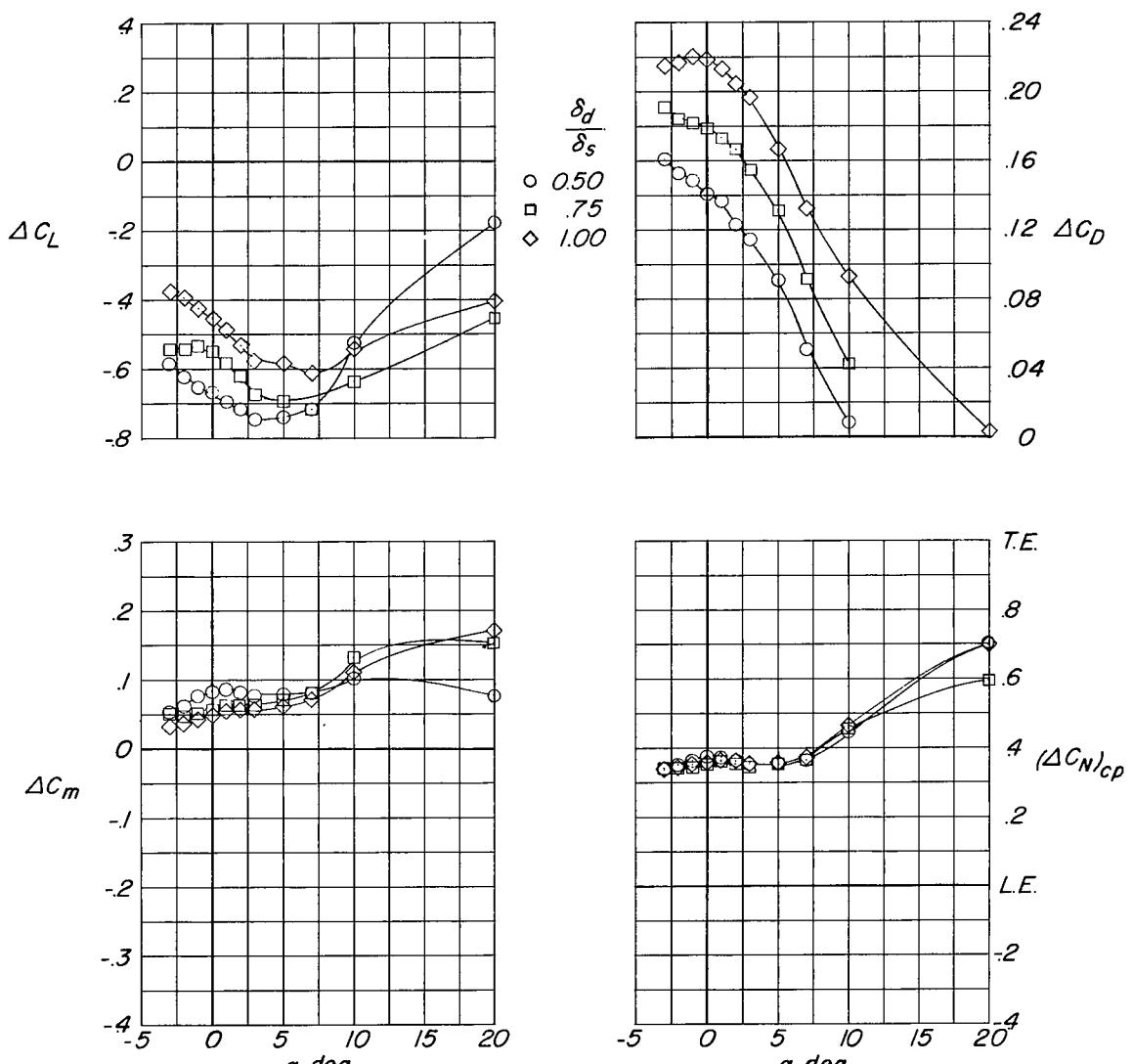
(a) $M = 0.60; \delta_s = -0.075$.

Figure 7.- Variation of the incremental lift, drag, and pitching-moment coefficients and center of pressure with angle of attack for the aspect-ratio-4 model having the spoiler-slot-deflector configuration at $x_s/c = 0.70$ and various control projection ratios (δ_d/δ_s).

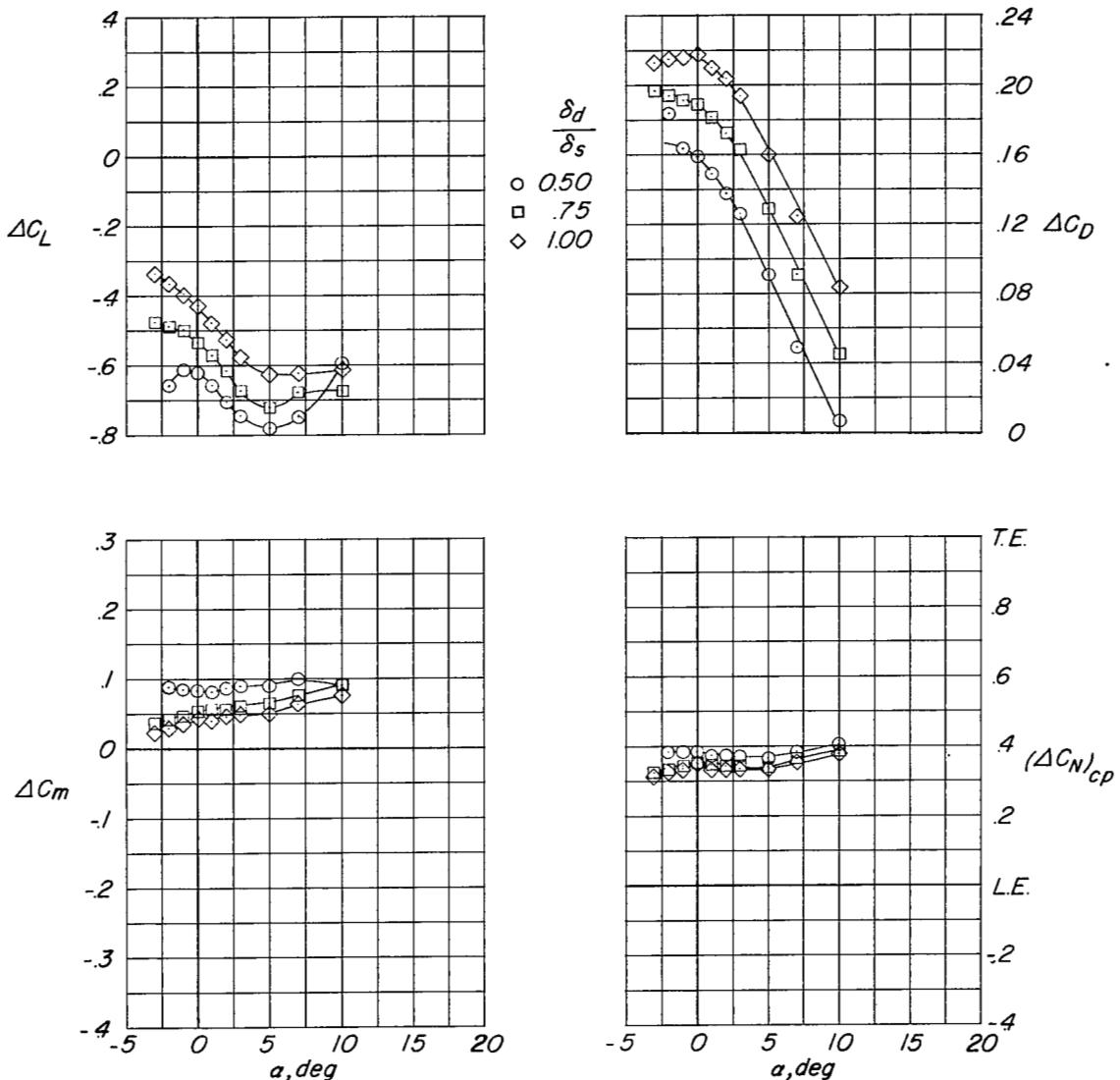
(b) $M = 0.80; \delta_s = -0.075.$

Figure 7.- Continued.

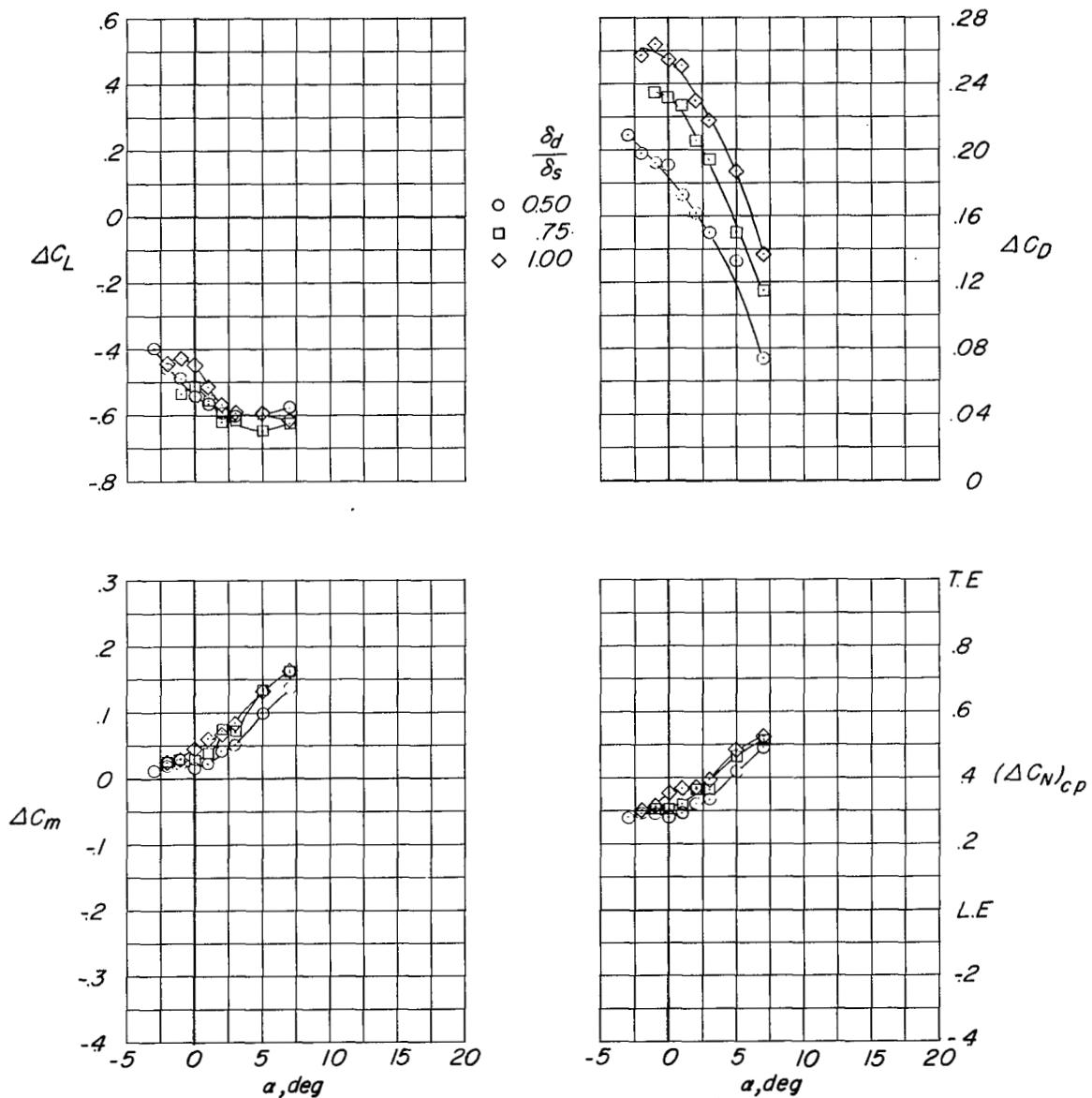
(c) $M = 0.95; \delta_s = -0.075.$

Figure 7.- Continued.

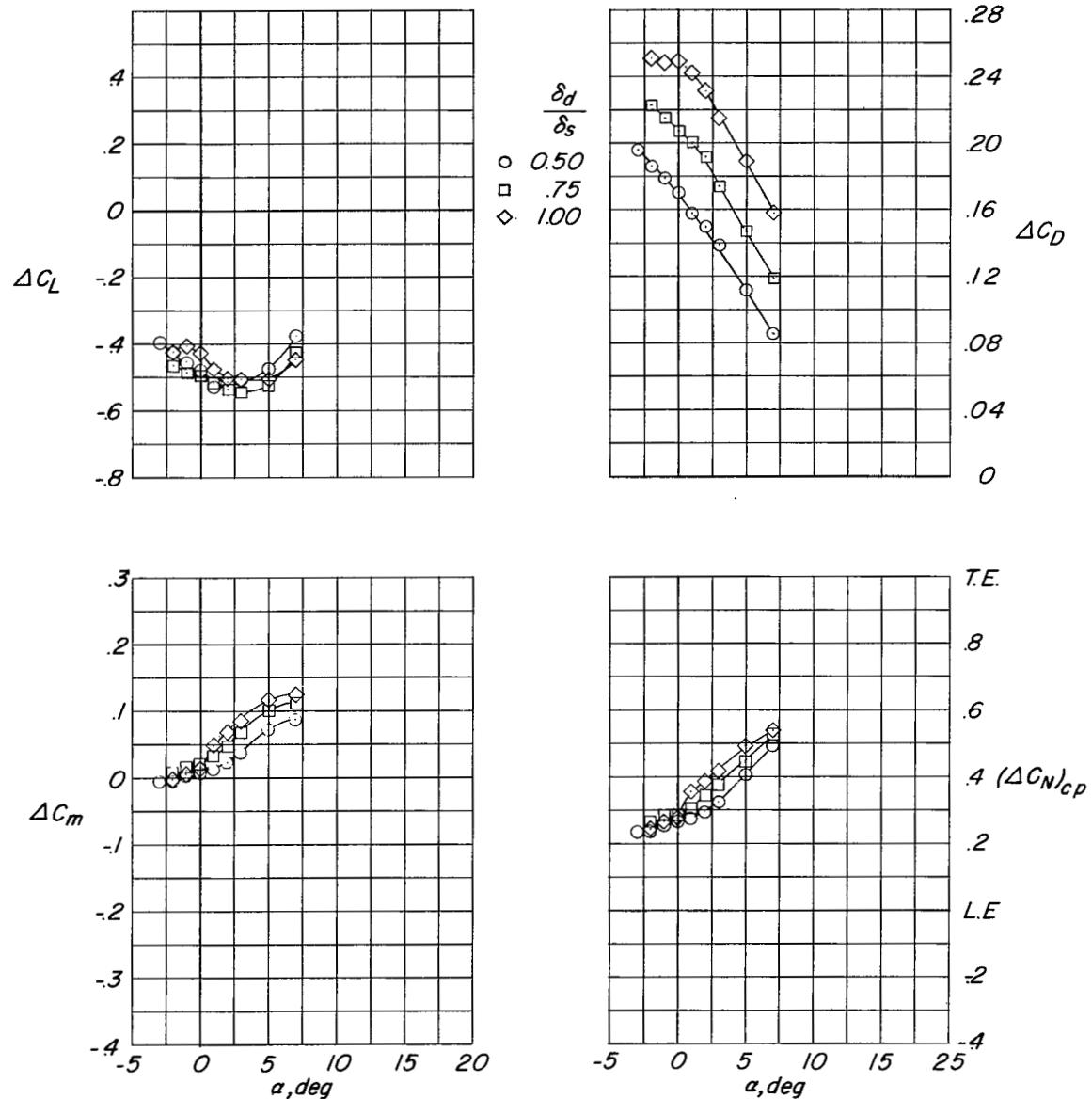
(d) $M = 1.05; \delta_s = -0.075.$

Figure 7.- Concluded.

NASA Technical Library



3 1176 01438 1124

~~CONFIDENTIAL~~